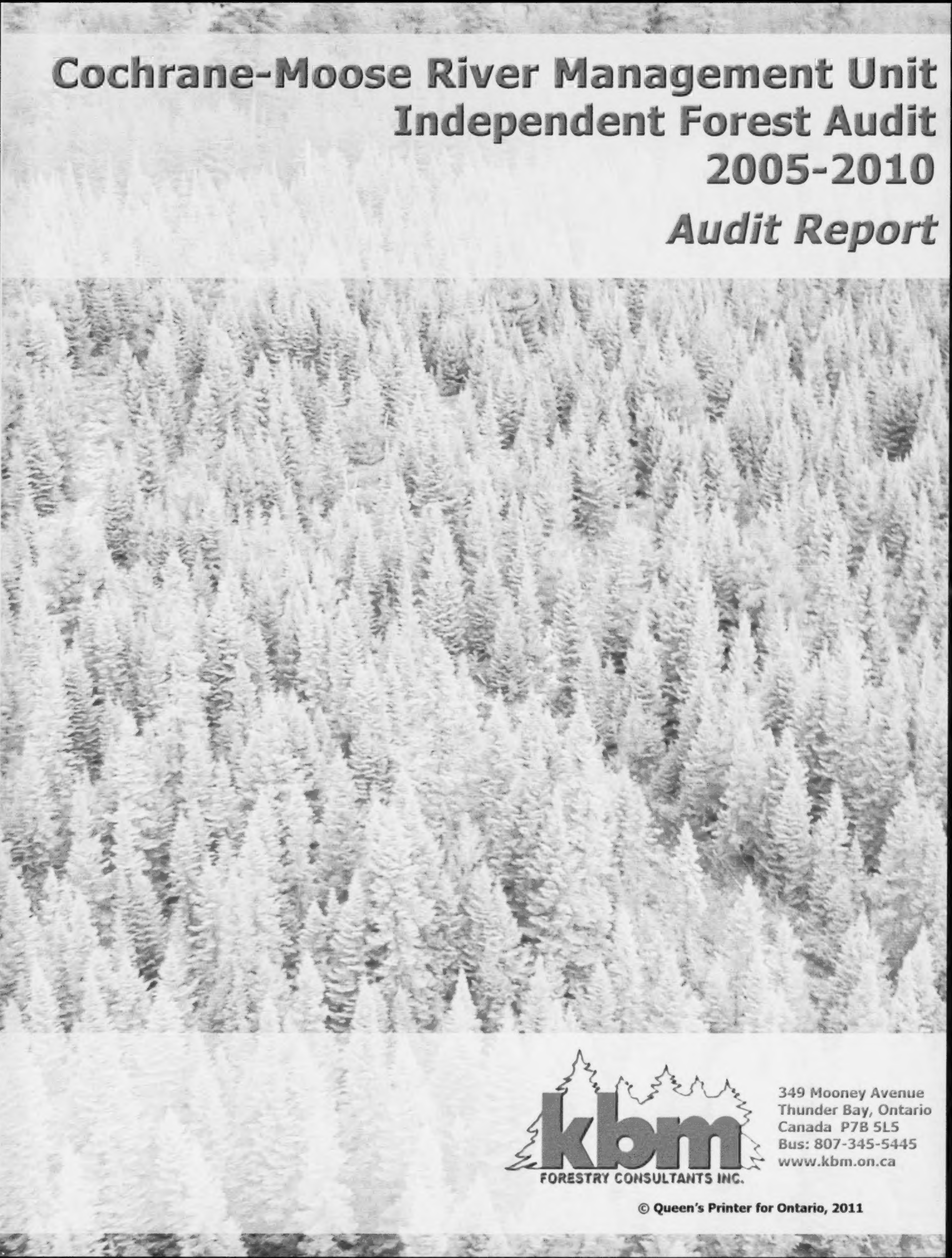

Cochrane-Moose River Management Unit Independent Forest Audit

2005-2010

Audit Report

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1.0 EXECUTIVE SUMMARY

This report, for the Cochrane-Moose River Management Unit (CMRMU or 'the Forest'), documents the results of an Independent Forest Audit conducted by KBM Forestry Consultants Inc. All Crown forests in Ontario are required to be audited at least every five years; the requirement for independent audits arising from MNR's Class Environmental Assessment Approval for Forest Management on Crown Lands in Ontario (2003). Regulation 160/04 of the Crown Forest Sustainability Act (S.O. 1994, c. 25) (CFSA) sets out the specific requirements for conducting the audits.

The audit covered the five-year period April 1, 2005 to March 31, 2010. It assessed implementation and selected aspects of planning of the final three years of the 2003-2008 FMP and the 2008-10 Contingency Plan, and planning for the 2010-20 FMP which was not finalized and instead became the 2010-12 Contingency Plan for the amalgamated Cochrane Area Forest (subsequently the Abitibi River Forest). The on-site component of the audit occurred from September 13 to 27, 2010. Document review and interviews occurred throughout the audit process. During the audit term the Forest was managed by MNR Cochrane District, with some forest management activities assigned to Tembec Inc. under a service provider agreement. The principal auditees were MNR Cochrane District and Tembec.

Based on the audit, 19 recommendations were made. Recommendations arise from audit team observations of material non-conformances, or may be developed to address situations in which the audit team identifies a significant lack of effectiveness in forest management activities. All audit recommendations are directed at either MNR or Abitibi River Forest Management Inc., a cooperative SFL holder who assumed management responsibilities on the Abitibi River Forest effective April 1, 2010. The majority of recommendations centred on deficiencies in the area of forest management planning. However, the key recommendations, discussed below, arose from audit team observations made in the field. A best practice was identified for the ongoing multi-partner woodland caribou research project that is providing valuable information to inform forest management planning and another for the comprehensive monitoring of silvicultural effectiveness and compliance by MNR.

Of the 19 audit recommendations there are three areas of concern that are considered key since they highlight the need to significantly alter certain current practices on the forest in the interest of sustainability. The first area of concern arises from the lack of clear direction from the Province that has allowed forest operations to leave significant amounts of waste wood fibre (slash) at roadside where it occupies productive forest land and prevents establishment of regeneration. This practice is not unique to the Cochrane-Moose River Management Unit or the amalgamated Abitibi River Forest; management of waste wood fibre (both slash and chipper debris) has been a recurring issue for years as evidenced by the many recommendations made in previous IFAs across Ontario. Only a change at the Provincial policy level, supported by forest management plan commitments and enforcement of such commitments through the Provincial compliance program is likely to lead to an effective, permanent solution. The second area of concern is associated with implementation of harvesting patterns that protect existing regeneration on upland sites. In the audit team's view this practice will lead to degrading of future stand composition through retention of less desirable species that will form a higher component of the new stand, and reduced productivity due to the inherently higher levels of competition on upland sites, resulting in lower stocking levels. A third related area of concern is the retention of mature larch seed trees in harvest blocks which is also contributing to a significant increase in the larch component on lowland sites.

The audit team concludes that management of the Cochrane-Moose River Management Unit was generally in compliance with the legislation, regulations and policies that were in effect during the term covered by the audit, and MNR met its legal obligations. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol.

No recommendation is made on licence extension since a new licence with a twenty year term was issued to Abitibi River Forest Management Inc. for the Abitibi River Forest in August 2010. A recommendation on licence extension will occur at the next IFA.

Rod Seabrook, EP(EMSLA)
Lead Auditor, on behalf of the audit team

2.0 TABLE OF RECOMMENDATIONS AND BEST PRACTICES

Recommendation on Licence Extension
No recommendation is made on licence extension since a new licence with a twenty year term was issued to Abitibi River Forest Management Inc. for the Abitibi River Forest in August 2010. A recommendation on licence extension will occur at the next IFA.

Recommendations/Best Practice Directed to SFL Holder/MNR District
Recommendation 1: MNR must ensure that the Local Citizens Committee Terms of Reference are updated to meet the content requirements of the FMPM.
Recommendation 2: MNR must ensure that the Steering Committee meets as required during the development of the 2012-22 Forest Management Plan and that minutes for those meetings are recorded, distributed to planning team members and included in the Forest Management Plan supplementary documentation.
Best Practice 1: The ongoing multi-partner woodland caribou study is an excellent example of applied research that has provided and continues to provide significant science-based contributions to forest management planning.
Recommendation 5: Abitibi River Forest Management Inc. must ensure that the next FMP contains biological or silvicultural rationale for planned clear cuts greater than 260 ha.
Recommendation 6: Abitibi River Forest Management Inc. must consider the harvest profile selected in the 2010-12 Contingency Plan when developing the profile for the next Forest Management Plan so that further substitution into younger age classes does not occur.
Recommendation 8: Abitibi River Forest Management Inc. must amend the utilization standards in the 2010-12 Contingency Plan to be consistent with the Northeast Region Operations Guide for Marketability Issues document or provide compelling rationale for the significant deviation from that direction document. The 2012-22 Forest Management Plan utilization standards should also conform to the Guide direction or provide rationale for departure.
Recommendation 9: The Abitibi River Forest planning team must consider on-the-ground results, current Provincial direction and the remote nature of a large portion of the Forest when modelling for productive land loss due to waste wood fibre in the 2012-22 Forest Management Plan.
Recommendation 11: Abitibi River Forest Management Inc. must include direction regarding management of chipping debris in the next Forest Management Plan.
Recommendation 12: Abitibi River Forest Management Inc. must consider the renewal profile selected in the 2010-12 Contingency Plan when developing the profile for the next Forest Management Plan and include sufficient analysis in the 2012-22 Forest Management Plan to justify the significant deviation from the planned Long Term Management Direction during the two year contingency period.
Recommendation 13: Abitibi River Forest Management Inc. must review the planned renewal assessment program in the 2010-12 Contingency Plan to ensure that the next Forest Management Plan covers the existing shortfall.
Recommendation 14: Abitibi River Forest Management Inc. must ensure the slash management plan in the 2012-22 Forest Management Plan can meet plan objectives and guidelines focused on minimizing loss of productive land. Abitibi River Forest Management Inc. should also deal with treatable backlog areas of slash.
Recommendation 15: Abitibi River Forest Management Inc. must: a) conduct an immediate review of all upland sites harvested under the Careful Logging Around Advanced Growth system since 2003 and implement remedial silvicultural treatments, where practical, on sites found not likely to become a silvicultural success b) implement exceptions monitoring on all upland Careful Logging Around Advanced Growth sites for which the use of natural advance growth (without planting) as a regeneration method is deemed as not recommended under the Silvicultural Guide.
Recommendation 16: Abitibi River Forest Management Inc. must address the increase in presence on the Forest of less desirable tree species such as larch and balsam fir.

Recommendation 17: Abitibi River Forest Management Inc. must implement an effective silviculture monitoring system, complete the assessment of naturally regenerating backlog areas, and report areas planned for natural regeneration within the timeframe specified in the Forest Management Planning Manual.

Best Practice 2: The monitoring of silviculture effectiveness and compliance by the Ministry of Natural Resources during the audit term was deemed to be excellent.

Recommendation 19: The Cochrane District Manager must ensure that submission timelines for Independent Forest Audit Action Plans and Status Reports are met.

Recommendations Directed to Corporate or Regional MNR

Recommendation 3: Corporate MNR, in consultation with the Ministry of Environment, must investigate and report upon lessons learned in the amalgamation and associated planning challenges encountered in the creation of the Abitibi River Forest to ensure information management systems and other procedures are adequate to deal with future amalgamations.

Recommendation 4: Corporate MNR must consider requiring that trade-off analysis be conducted using an appropriate decision support tool on amalgamated forests.

Recommendation 7: MNR Region must update the *Northeast Region Operations Guide for Marketability Issues* document as follows:

- reduce the allowance for residual standing trees to no more than 25% canopy closure to better align the Guide with inventory standards
- incorporate a requirement to provide information, in addition to the current FRI description, to confirm actual stand conditions prior to finalizing operational plans
- clarify the allowance for bringing unmarketable trees to roadside in order to minimize the loss of productive area along roadways

Recommendation 10: Corporate MNR must develop a policy to address waste fibre management, consistent with the intent of minimizing losses of productive forest land, and provide associated direction to MNR regions, districts and the forest industry, including standards for acceptable allowances for conversion of productive forest land to non-productive forest land. MNR should also periodically report to the public the cumulative loss of area and growing stock potential due to forest land occupied by waste fibre.

Recommendation 18: Corporate MNR must review the reporting procedures and consider modifying them to recognize multiple successional pathways to improve the adaptive management process.

3.0 INTRODUCTION

3.1 Audit Process

Independent Forest Audits (IFAs) are a requirement of the Crown Forest Sustainability Act (S.O. 1994, c.25) (CFSA) and the Forest Management Class Environmental Assessment on Crown Lands in Ontario. Every forest management unit in Ontario must be audited by an independent party at least once every five years. The Independent Forest Audit Process and Protocol (IFAPP) was developed by MNR to provide a comprehensive and consistent method of evaluating forest management activities on Crown land. It serves as a framework that provides a structured approach to evaluating whether or not forest management activities meet the requirements governing forestry practices on Crown land in Ontario.

Fifth year IFAs of the Cochrane-Moose River Management Unit (CMRMU), Iroquois Falls Forest (IFF) and Smooth Rock Falls Forest (SRFF) were conducted for the period April 1, 2005 to March 31, 2010 by KBM Forestry Consultants Inc. (KBM) in 2010 in accordance with the *Crown Forest Sustainability Act*, Section 26(3). At the time of audit the three forests were in a state of transition in terms of forest management responsibilities. On April 1, 2010 they were amalgamated with the Nighthawk Forest to form the Abitibi River Forest.

A cooperative shareholder agreement was signed in January, 2010 that formed a new management company, Abitibi River Forest Management Inc. (ARFMI). An SFL for the Abitibi River Forest was issued to ARFMI in October 2010, covering the term April 1, 2010 to March 31, 2030. Until the new SFL was in place, forest management responsibilities resided with Tembec (Smooth Rock Falls Forest), AbiBow (Iroquois Falls Forest), and the Cochrane District MNR (Cochrane-Moose River Management Unit). ARFMI has entered into a service provider contract with First Resource Management Group Inc. (FRMG). FRMG is currently transitioning the forest management activities and was the point of contact for the IFA.

Within the report the audit team has made recommendations to address instances of non-conformance to a law and/or policy, or an identified lack of effectiveness in forest management activities. Recommendations are listed in the table in the previous section and presented within the main body of the report together with a brief description of the issue leading to the recommendation. A full discussion of the issue, including the link to the IFAPP principle, criteria and audit procedure, associated background information, summary of evidence and conclusion leading to the recommendation is contained in Appendix 1.

As the new SFL is in place, related audit findings are now directed to ARFMI, instead of the individual forest managers responsible during pre-amalgamation. Audit recommendations related to responsibilities of MNR continue to be directed to the appropriate organizational level within MNR. More detailed information on the audit process and sampling is provided in Appendix 4 of this report.

KBM conducted the IFA on the CMRMU for the five-year period April 1, 2005 to March 31, 2010. Audit team members and their qualifications are presented in Appendix 6. The audit assessed portions of planning and implementation as described in Table 1.

Table 1. Forest management plans within audit scope.

Audit Aspects	Forest Management Plans
Implementation and selected aspects of planning	2003-08 Cochrane-Moose River Management Unit FMP (2005-08 only)
	2008-10 Cochrane-Moose River Management Unit Contingency Plan
Planning	2010-20 Cochrane Area Forest* FMP - planning process and LTMD development: Note this plan did not proceed to completion and was replaced by the 2010-12 Contingency Plan for the Cochrane Area Forest, referred to below.
	2010-12 Contingency Plan - Cochrane Area Forest planning process and development

* The Cochrane Area Forest has become the Abitibi River Forest consisting of the former Cochrane-Moose River Management Unit, Smooth Rock Falls Forest, Iroquois Falls Forest, and the Nighthawk Forest.

3.2 Management Unit Description

The CMRMU is located in Northeastern Ontario within MNR's Northeast Region. It is an amalgamation of portions of the former Cochrane and Moose River Management Units in 2003. The former units were then managed as sub-units of the amalgamated unit. During the audit period MNR Cochrane District administered and had forest management responsibility on the CMRMU. An SFL was not signed for the unit; rather, MNR negotiated service agreements that assigned forest management responsibilities to Tembec. Tembec sub-contracted some of the responsibilities on the Cochrane sub-unit to Norbord (now True North Plywood).

The 2003-08 FMP and 2008-10 Contingency Plan (CP), Annual Reporting and Work Schedules during the audit term were prepared by Tembec under a service agreement with MNR. Most of the forest operations on the CMRMU were completed by Tembec except for harvesting activities on the Cochrane sub-unit, which were undertaken by independent operators (Forest Resource Licensees (FRLs)). FRL holders were also responsible for forest access for their harvest blocks. Compliance monitoring was completed by Tembec on their operations, by Norbord on their operations and by MNR for all Independent Operators on the Cochrane sub-unit.

During the audit term, the majority of wood harvested from the CMRMU was processed by facilities in Cochrane, Smooth Rock Falls, Iroquois Falls, Timmins, and Englehart with the balance sent to facilities in Quebec.

Figure 1 illustrates the CMRMU within the amalgamated Abitibi River Forest while Figure 2 depicts the CMRMU in relation to other Crown management units in Ontario.

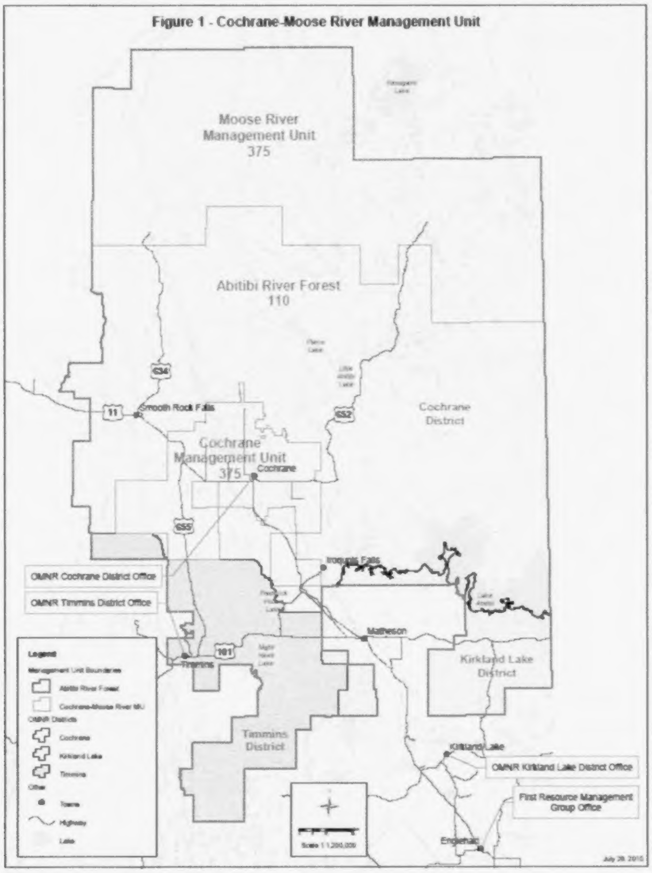


Figure 1 - Cochrane-Moose River Management Unit
Moose River Management Unit 375
Abitibi River Forest 110
Cochrane District
Cochrane Management Unit 375
634
11
652
655
101
Smooth Rock Falls
Cochrane
Iroquois Falls
Matheson
Timmins
Kirkland Lake
Englehart
Kirkland Lake District
Timmins District
OMNR Cochrane District Office
OMNR Timmins District Office
OMNR Kirkland Lake District Office
First Resource Management Group Office
Legend
Management Unit Boundaries
Abitibi River Forest
Cochrane-Moose River MU
OMNR Districts
Cochrane
Kirkland Lake
Timmins
Other
Towns
Highway
Lake
Scale 1:1,200,000
July 28, 2010

Figure 1. Location of the Cochrane-Moose River Management Unit in Relation to the amalgamated Abitibi River Forest.
(Source: First Resource Management Group)

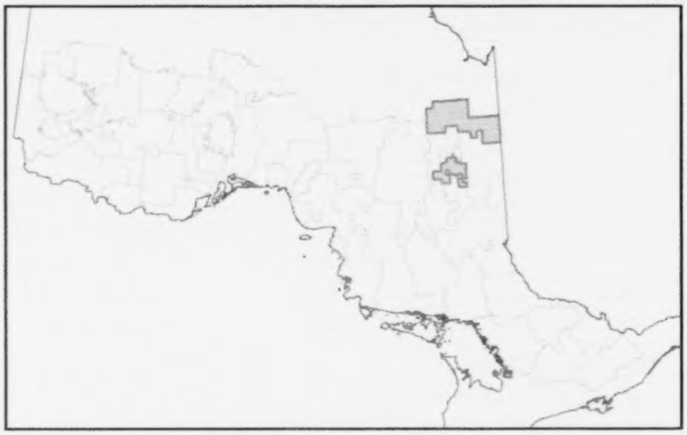


Figure 2. Location of the Cochrane-Moose River Management Unit in Ontario. (Source: Ontario Ministry of Natural Resources)

The Moose River sub-unit borders the Province [illegible] Quebec to the east, the area of the undertaking to the north, the Gordon Cosens Forest to the west, and the Smooth Rock Falls and Iroquois Falls Forests to the south. The Cochrane sub-unit is bordered to the north and south by the Nighthawk Forest, to the west by the Smooth Rock Falls Forest and to the east by the Iroquois Falls Forest. The CMRMU encompasses the communities of Cochrane and Iroquois Falls, as well as the New Post Indian Reserve (Taykwa Tagamou First Nation).

The CMRMU has a landbase of 1,298,176 ha It occurs fully within the Boreal Forest Region of Ontario and forest cover is predominantly lowland black spruce stands with small components of larch and cedar and infrequent upland stands dominated by spruce, poplar, birch, balsam fir and occasional jack pine. Crown managed productive forest land occupies 561,984 ha. The managed Crown production forest is comprised of 509,277 ha of regular production forest stands, 29,253 ha of recent disturbance (harvest areas and natural depletion areas i.e. fires) and 23,455 ha of areas deemed to be below regeneration standards.

The CMRMU lies in part within the northern Clay Belt which is characterized by moderately to gently rolling bedrock, generally covered by deep deposits of clay, silt and sand. Limited eskers running in a north-south direction contrast with an otherwise flat topography. The majority of the forest soils are clay and peat with some areas of glacial-fluvial silts and sands. Bedrock caps are not uncommon in pockets on the Unit. The lowland, moist to wet site conditions are susceptible to rutting if operated during the frost-free period so a majority of harvesting activities occur during the winter.

3.3 Current Issues

The IFAPP requires a review of High Priority Aspects (HPAs) of the auditees' systems or activities. These are areas of potential focus during the audit related to key issues or management challenges during the audit term. A discussion of potential HPAs on the amalgamated Forest was held during the pre-audit meeting and three HPAs were subsequently included in the Audit Plan, as follows.

1. Underutilization of unmarketable species such as balsam fir
2. Compliance issues on the Marceau Road (former Smooth Rock Falls portion)
3. Staff turnover and layoffs in the forest industry

In addition, the audit team deemed that there were other issues that needed focus during the audit, specifically:

4. The severe economic downturn in the forest products industry significantly reduced actual harvest levels compared to planned levels during the audit term. Locally, the downturn aided in the permanent closure in 2006 of Tembec's pulp mill in Smooth Rock Falls and the indefinite closure of their sawmill in Timmins. A labour dispute in 2006 and depressed markets for OSB also led to idling of the Grant Forest Products OSB mill in Timmins; this mill is still idle.
5. Piling and burning of roadside logging slash was not conducted on many of the blocks logged since 2006. This will result in areas of productive land being unavailable for regeneration if left in their current state.

All of the issues identified above were reviewed during the audit and comments and recommendations emanating from the audit findings are incorporated into the audit report as appropriate.

2.4 Summary of Consultation and Input to Audit

Opportunities were provided throughout the audit process for consultation with and input from auditees and other interested parties. The audit team spoke with staff from MNR, Tembec, Local Citizen Committee (LCC) members, wood supply commitment holders, and members of four First Nation (FN) communities. In addition, comments were received in response to a questionnaire made available to the public. A summary of the methods and input is provided in Appendix 4.

4.0 AUDIT FINDINGS

4.1 Commitment

The Province has documented its commitment to sustainable forestry principally through the Crown Forest Sustainability Act. MNR, in turn, has documented policies and other guidance that establish its commitment to sustainable forestry and resource management, consistent with the requirements of the CFSA. These are communicated throughout MNR and are promoted with resource users and the general public. MNR maintains a public website where these commitments are available:
http://www.mnr.gov.on.ca/en/Business/Forests/2ColumnSubPage/STEL02_163861.html

Tembec has an Environmental Policy that includes commitments to sustainable forest management and a separate environmental management program known as Forever Green® that contains a set of guiding principles and associated values to provide direction for its forest managers. It also requires implementation of an environmental management system in conformance with the ISO 14001 standard.

Commitment to sustainable forestry, as demonstrated through compliance to regulatory requirements and conformance to the direction contained in forest management guides and forest management plans was demonstrated by both MNR and Tembec during the audit term.

4.2 Public Consultation and Aboriginal Involvement

Three LCCs are associated with the Abitibi River Forest (Cochrane, Kirkland Lake and Timmins). A sample of LCC members contacted during the audit was satisfied with the performance of the committees, the support provided by MNR and the cooperation of the companies. There was a desire expressed by members for more representation on the LCCs from area Aboriginal communities. Despite ongoing efforts, as in other districts, securing Aboriginal representation on LCCs has been a challenge.

Some concerns were stated over the low turn out at information centres, and the advertising style and frequency of public notices. Minutes of LCC minutes indicated overall acceptable levels of attendance by members and a good coverage of topics. Terms of Reference for the individual LCCs were current; however, the Cochrane LCC Terms of Reference (updated version March 2009) did not meet all the content requirements of the 2004 FMPM.

Recommendation 1: MNR District must ensure that the LCC Terms of Reference are updated to meet the content requirements of the FMPM.

The Cochrane Area LCC is the lead LCC for forest management planning on the Abitibi River Forest and there was active participation on the planning team during planning for the 2010-12 CP. The Committee was reorganized in 2006 in response to concerns raised during the previous IFA about the functionality of the Committee. The reorganization appears to have been effective in addressing the concerns. Members found meetings productive and informative; dialogue is very much encouraged and questions are welcomed.

The MNR has provided adequate support for the LCC and has kept LCC members up to date on current events, answered questions in a quick and timely manner, and ensured minutes were distributed after each meeting. According to LCC member interviews and questionnaire responses, the MNR District Manager and SFL holder attended most meetings where topics of interest were discussed and evidence was presented that demonstrated LCC involvement in the categorization of amendments.. LCC members found AbiBow and Tembec representatives to be cooperative and reasonable; they listened to concerns with an open mind and tried their best to address issues.

In general, the public does not use the LCC as a method of raising concerns or accessing information on forest management. Most members of the LCC do not formally report back to the stakeholder group they represent. If and when they did, it was generally in the form of a casual conversation.

Multiple learning opportunities were provided to members of the LCCs (forum in Sault Ste. Marie, Aboriginal Sensitivity Training, Caribou Planning, Bearwise, etc). Most members had attended at least one event, and were aware of the other events that were available.

Notifications to the public met FMP requirements for the 2010-12 CP and there were no concerns that led to implementation of the issue resolution process during planning. There were also no minor or major amendments, and therefore no requirement for public notices of such, on the CMRMU during the audit term.

As part of the FMP process for the 2008-10 CP, notices were to be provided to the Aboriginal community as per the public notice requirements but with modifications that directed the notice to each Aboriginal community. At the time of the CP, there were three First Nations that were directly affected by operations of the CMRMU. As per the FMPM requirements, letters were sent to the Aboriginal Communities inviting them to participate six months prior to the standard invitation to participate. The letter included reference to the opportunity for the community to have their own information center, which all three communities did. Notices were also published in the Native language in the Wawatay News. All three First Nations participated on the planning team and the LCC.

Based on the review of the documentation and interviews with First Nations representatives, the auditor is satisfied that all of the requirements were met pertaining to Aboriginal Consultation. The First Nations representatives interviewed did not express any issues with the management of the Forest and were satisfied that their values were being protected during the period of the 2008-10 CP.

All requirements pertaining to notices to Aboriginal communities during planning for the 2010-20 FMP (subsequently the 2010-12 CP) were met. Prior to amalgamation of the forests, three First Nations were involved in both the Smooth Rock Falls Forest and the Iroquois Falls Forest (Taykwa Tagamou, Moose Cree and Wahgoshig). With amalgamation, an additional four communities were included in the notice requirements for the amalgamated forest.

Flying Post reserve is on west side of the Romeo Mallettete Forest and was not interested in engagement during the development of the 2010-12 CP but asked to be made aware of any issues that may involve their traditional territory. There are no residents occupying the reserve at this time. Mattagami First Nation is located at the southern end of the Romeo Mallettete Forest. This group once had a forest contracting business and had some contracts with Domtar; however they are not currently interested in conducting forestry operations. Matachewan is also more associated with the Timiskaming Forest and

Nighthawk Forest. Due to location, opportunities were limited for the communities of Flying Post, Mattagami, Matachewan and Beaverhouse.

4.3 Forest Management Planning

Planning Team

Through interviews with company and MNR staff and a review of the 2010-12 CP and Supplementary Documentation, it was determined that planning team derivation and development of the Terms of Reference met all FMPM requirements with one exception - the Terms of Reference was not approved until after the Notice of Invitation was released. The Terms of Reference for the current planning effort (2012-22 FMP) was developed and approved in accordance with the FMPM prior to issuing the Notice of Invitation so no recommendation is required because corrective action has already occurred.

The amalgamation of four forests managed by three agencies, across three Districts created numerous procedural and technical challenges. In addition, the collapse of forest markets led to a loss of revenue to SFL companies. Given these circumstances, it is not surprising that the planning team encountered delays in meeting some checkpoints (i.e. planning inventory and base model) early in the planning process for the 2010-20 FMP. In the final year of plan preparation, these delays had been overcome and the long term management direction was approved. This represents quite an achievement and reflects well upon the individuals and their organizations involved in the planning process under such challenging circumstances.

It may have been possible to have an approved plan in place for 2010, but the remaining time lines were short. In addition, there were concerns that the Caribou Conservation Plan and other regulations arising from the 2007 Endangered Species Act would have a significant impact on a newly approved plan, possibly leading to requests for an Individual Environmental Assessment (EA bump up) or the need for significant amendments. These factors led to a determination by the Steering Committee that a contingency plan would be required.

Compared to an FMP, a contingency plan allows less time for public and MNR review. In the case of the CMRMU it represents two contingency plans in a row. The reasons for going to a contingency plan were properly documented in the contingency plan proposal; however, some planning team members questioned the need for a contingency plan because, in their opinion, sufficient progress had been made in developing the 2010-20 FMP at the time the decision was made. It would appear that the Steering Committee's rationale for a contingency plan was not fully understood by all planning team members.

The Steering Committee plays an important role in the planning process. The Steering Committee only met twice during the development of the 2010-12 CP, contrary to the Terms of Reference which called for quarterly meetings, and no minutes were recorded for those meetings. The 2009 FMPM directs the Steering Committee to monitor planning progress.

Recommendation 2: MNR Cochrane District must ensure that the Steering Committee meets as required during the development of the 2012-22 FMP and that minutes for those meetings be recorded, distributed to planning team members and included in the FMP supplementary documentation.

Plans

The 2010-12 CP lacked a forest management unit description section. While this was consistent with the approved Contingency Plan Proposal, the FMPM states "*A contingency plan is an interim forest management plan that is required when special circumstances affect the implementation of a forest management plan*". In the audit team's view, a new forest created through amalgamation should have an interim forest management plan that contains a description of the new forest. The amalgamated Abitibi River Forest illustrates the need for MNR to consider the implications of large scale forest amalgamations in not only meeting FMPM requirements but in determining, for example, how LCCs are formed, how roles are distributed among District offices and how trends analyses are interpreted. There are positive aspects of the amalgamation worth noting as lessons learned. The three Districts, in cooperation with the LCCs, developed a protocol that was followed to allow for efficiencies in the delivery of various services.

Questions emerge from this amalgamation that deserve further consideration. For example, since all of the forests had data that met the Forest Information Manual (FIM) requirements, why did it take such a lengthy period of time to develop the planning inventory? Are there problems with FIM or were there inadequate resources to bring the inventory together? Why does the MOE and MNR not consider a forest description for a new forest to be important in a Contingency Plan? Are there redundancies in the planning manual describing the required content of a management plan?

Recommendation 3: Corporate MNR, in consultation with the Ministry of Environment, must investigate and report upon lessons learned in the amalgamation and associated planning challenges encountered in the creation of the Abitibi River Forest to ensure information management systems and other procedures are adequate to deal with future amalgamations.

According to interviews, the 2012-22 FMP under development is already considering a contingency plan requirement for its first year of operation. If a new contingency plan is developed it should include the forest management unit description section.

The plan text and analysis package provided a clear and accurate description of the Sustainable Forest Management Model development. While technical aspects of the model were complete, more sophisticated planning models (i.e. spatial planning tools) could have aided in the analysis of planning issues surrounding the trade-off between socio-economic and non-timber objectives; this is discussed in Recommendation 4, below.

It is apparent that amalgamation allowed for meeting the current planned industrial demand for fibre that otherwise would likely not have been met if each forest prepared separate plans. The long term management direction (LTMD), age class substitution and allocation pattern selected in the 2010-12 CP are a concern with regards to sustaining the flow of forest benefits over the long run.

- The LTMD allows for decreases of some cover types to as low as 70% when compared to levels derived by simulation of fire events at the amalgamated forest level and as low as 40% within subunits. Typically, forests in Northwestern Ontario use a minimum level of 80% relative to levels derived by simulation of fire events. According to ARFMI, forest management plans in Northeastern Ontario most often use a minimum level of 65-70% in the "tests of sustainability". There is no Provincial standard threshold at this time but some direction is expected with the pending release of the *Forest Management Guide for Boreal Landscapes*.
- The harvest allocation also had considerable amounts of substitution of younger forest compared to older age classes identified by the strategic model (SFMM). If these age class substitutions were to continue over the long term, the forecasted flow of forest benefits and other objectives will not be achieved. The age class substitution is discussed in more detail later in this section.
- The LTMD and selected allocation pattern has led to a form of forest zoning, with longer harvest rotations being associated with more distant forests and caribou habitat while shorter rotations are found near mills. This strategy seems reasonable but is not adequately described in the plan in a way that could be grasped by the general public.

The Abitibi River forest is an example of a forest operating at a scale more consistent with the *Forest Management Guide for Boreal Landscapes*. Such a scale should allow for better solutions to landscape-level issues. However, the reporting of various forest cover indicators at this large scale may come at the expense of localized issues such as representation of certain forest cover types within some management sub-unit locations. Models other than SFMM allow such trade-offs to be more transparent at different scales of resolution. Given the pressure on wood supply and non timber values, the preparation of forest management plans on amalgamated forests would benefit from a more careful analysis of trade-offs at different scales using additional decision support tools.

Recommendation 4: Corporate MNR must consider requiring that trade-off analysis be conducted using an appropriate decision support tool on amalgamated forests.

MNR should consider requiring that the associated FMP document an acceptable rationale when the decision is made not to use such a tool.

Modelling

Two models were used to define the social and economic impacts of the 2010-12 CP selected management strategy – MNR's Socio-Economic Impact Model (SEIM) and a Regional Community Constellation Impact Model (RCCIM) developed by the Lake Abitibi Model Forest. Normally, only SEIM is used in planning. This extra effort in describing socio-economic impacts using RCCIM is commendable; however, many details are left in the supplementary documents and little explanation is offered in the text of the plan. For example, a section reads; "Wages and salaries will account for 62.0% of Gross Provincial Income impact" without defining what this indicator means. Some additional expertise should be secured to help interpret the outputs of socio-economic models to both inform and report upon the development of the long term management direction. The Planning Team for the next forest management plan should build upon the successful use of a new socio-economic model by securing additional expertise to help interpret the model outputs and then properly report on the likely affects on the long term management direction.

Woodland Caribou

In 1998 a multi-partner research initiative was established to study woodland caribou. This study has contributed significantly to knowledge of caribou movement and range use. Further collaring and tracking of both caribou and wolves is planned.

Best Practice 1: The ongoing multi-partner woodland caribou study is an excellent example of applied research that has provided and continues to provide significant science-based contributions to forest management planning.

Harvest

Eligibility and selection criteria for harvest, renewal and maintenance were well described in the CP. Contingency area planning was also thorough and well done. Planning has occurred so that residual stand structure requirements can be met. This includes provision of insular/peninsular areas, individual residual trees and downed woody material for wildlife use in planned harvest areas.

Yield curves developed for the 2010-12 CP were reduced by volumes planned to be left to meet residual requirements and are reasonable for the Forest. Table FMP-19 contains a summary of planned wood fibre dispersal that indicates achievement of all volume commitments and business arrangements.
The 2010-12 CP contained a number of planned clearcuts greater than 260 ha in size however the plan lacked the required rationale.

Recommendation 5: ARFMI must ensure that the next FMP contains biological or silvicultural rationale for planned clearcuts greater than 260 ha.

Planned harvest in the 2010-12 CP includes a significant amount of age class substitution - about 9,000 ha. The original intent was to re-align the allocation over the remaining eight years of the planned 2010-20 FMP but, according to interviews with MNR staff, the new plan is to produce a 2012-22 FMP. Due to the severe downturn in the forestry sector it is highly unlikely that the full planned harvest will be realized, so there is little risk to forest sustainability due to the age class substitution. The short term of the CP (two years) was also considered in this determination. However, the audit team has a concern regarding further/continued age class substitution on the Forest.

Recommendation 6: ARFMI must consider the harvest profile selected in the 2010-12 CP when developing the profile for the next FMP so that further substitution into younger age classes does not occur.

Direction regarding utilization in the 2010-12 CP was adapted from the *Northeast Region Operations Guide for Marketability Issues* (Apr, 2008). The Northeast Guide is considered a thoughtful resource for use by forest management planners to keep compliant with the requirements of the Scaling Manual but there are issues with the amount of residual canopy considered acceptable under the Guide. In addition, there is no formal requirement to complete pre-harvest ground verification of forested conditions and the allowance for bringing unmarketable trees to roadside under the Guide could lead to loss of productive land.

Recommendation 7: MNR Region must update the *Northeast Region Operations Guide for Marketability Issues* document as follows:

- reduce the allowance for residual standing trees to no more than 25% canopy closure to better align the Guide with inventory standards
- incorporate a requirement to provide information, in addition to the current FRI description, to confirm actual stand conditions prior to finalizing operational plans
- clarify the allowance for bringing unmarketable trees to roadside in order to minimize the loss of productive area along roadways

The 2010-12 CP allows the leaving of up to 70 residual standing trees on all sites which is a considerable departure from the Guide direction (i.e. leave between 25 and 50 residual trees on conifer sites). There was no rationale provided in the FMP for this deviation. Considering the Guide is the local resource used to aid in keeping utilization standards compliant with the Scaling Manual, the Guide direction should have been closely adhered to.

Recommendation 8: ARFMI must amend the utilization standards in the 2010-12 CP to be consistent with the Northeast Region Operations Guide for Marketability Issues document or provide compelling rationale for the significant deviation from that direction document. The 2012-22 FMP utilization standards should also conform to the Guide direction or provide rationale for departure.

Modelling for the 2010-12 CP included forecasting productive land losses due to waste wood fibre (i.e. slash). No conversion was modelled after 30 years as all roads were assumed to be in place and slash disposal methods (e.g. biomass utilization) were expected to reduce slash losses to 0%.

Considering minimal on-the-ground improvement has occurred in slash management over the past 30 years and much of the Forest is very remote, the audit team believes the model assumption of no slash losses after 30 years is overly optimistic.

Recommendation 9: The Abitibi River Forest planning team must consider on-the-ground results, current Provincial direction and the remote nature of a large portion of the Forest when modelling for productive land loss due to waste wood fibre in the 2012-22 FMP.

The 2010-12 CP includes modelling allowances and a corresponding slash management plan that, if fully implemented, would free-up about 108 ha of productive lands but also permits the conversion of significant amounts of forested land to non-forest condition. The slash planned to be left will be a considerable physical and chemical impediment to renewal of this productive Crown land. Significant amounts of unmanaged roadside slash were observed during the field audit (See Section 4.4).

Recommendations related to recovering productive Crown forest land along roadways from waste fibre span the entire period since the beginning of the IFA process (1996) and were the subject of recommendations during the Forest Management Agreement (FMA) Reviews that predate the IFAs. These recommendations range across virtually every management unit in the Northeast and Northwest Regions and have typically been the subject of repeat audit findings. Recommendations have also been directed at Corporate MNR to provide clear direction on this subject. Despite this, MNR has only provided two somewhat ambiguous guidelines in the recently published Stand and Site Guide that will likely not lead to improvement in waste fibre management on Crown lands. Under current direction, the audit team believes that there will continue to be a significant long term loss of productive forest area to waste fibre.

Recommendation 10: Corporate MNR must develop a policy to address waste fibre management, consistent with the intent of minimizing losses of productive forest land, and provide associated direction to MNR regions, districts and the forest industry, including standards for acceptable allowances for conversion of productive forest land to non-productive forest land. MNR should also periodically report to the public the cumulative loss of area and growing stock potential due to forest land occupied by waste fibre.

According to company representatives there is a plan to increase in-bush chipping on the Abitibi River Forest in the near future. While in-bush chipping can reduce slash accumulation, chipper debris can become a localized issue; this has been observed by the auditors on several audits of management units in Ontario. There was no direction in the 2010-12 CP regarding management of chipping debris.

Recommendation 11: ARFMI must include direction regarding management of chipping debris in the next FMP.

A review of the Annual Work Schedules (AWSs) was completed to assess the preparation of harvest, renewal and tending Forest Operation Prescriptions (FOPs). FOPs were found to be consistent with Silvicultural Ground Rules (SGRs) and were prepared in accordance with the FMPM. FOPs were confirmed to have been updated in the AWS for blocks which had changes to original prescriptions based on follow-up site visits.

Renewal

The 2010-12 CP SGRs were prepared in accordance with the FMPM and approved silvicultural guides and were consistent with the selected management alternative (SMA). A discrepancy was found between the modelled and planned silviculture program. According to the 2010-12 CP the planned overage in extensive activities during the two-year period was to be reconciled over the remaining eight years of the proposed ten-year plan (i.e. 2010-20 FMP). However, documentation and interviews indicate that a 2010-20 FMP is no longer scheduled; instead, a 2012-22 FMP is now being planned. Therefore the 2010-12 CP will become a stand-alone document and the deviation between modelled and planned renewal may not be reconciled.

In addition, the Cochrane-Moose River 2008-10 CP had a planned renewal program that deviated from the model by relying more heavily on extensive operations. This was due to uncertainties in achieving planned harvest and having to order trees up to one and one-half years in advance of planting. Rationale also included noting that renewal discrepancies will be made up in the next plan (this turned out to be the 2010-12 CP for the amalgamated forests). As noted, the 2010-12 CP also deviated; therefore this was not reconciled as planned.

The deviation between modelled and planned renewal in the 2008-10 CP for the CMRMU and the 2010-12 CP for the amalgamated forests, which select more extensive treatments than modelled, does not meet FMPM requirements.

Recommendation 12: ARFMI must consider the renewal profile selected in the 2010-12 CP when developing the profile for the next FMP and include sufficient analysis in the 2012-22 FMP to justify the significant deviation from the planned LTMD during the two year contingency period.

Silviculture support planned in the 2010-12 CP will meet planned renewal indicated in Table FMP-21 and planned planting/seeding densities. The current seed inventory is adequate to meet the proposed operations; however, two concerns related to silviculture support exist:

- The current first generation jack pine and black spruce tree improvement orchards are aging (currently about 25 years old); it will become more difficult each year to economically harvest seed from these sites. Plans to establish second generation orchards have been curtailed since 2004 due in large part to budgetary limitations. Failure to implement a succession strategy for the current seed orchards may lead to a significant shortage in available improved seed.
- Silviculture support planned would likely not support a more intensive program such as that modelled in the 2010-12 CP.

ARFMI should consider the longevity of current seed orchards and the likely needs of the Forest when determining seed requirements for future operations.

The plan text clearly identifies timelines for regeneration surveys for each forest unit and the assessment of not sufficiency regenerated or barren and scattered areas. Naturally regenerating conifer stands are surveyed six years post establishment to identify any required follow-up treatments. The assessment of Careful Logging Around Advanced Growth (CLAAG) areas for potential follow-up treatment is discussed; however, no survey timelines are defined in the plan. In addition, the plan does not address how artificially regenerated stands will be assessed for regeneration success and/or possible follow-up treatments prior to assessment for Free-to-Grow (FTG).

Considering the competitive nature of many upland sites on the Forest and the relatively low silviculture success during the audit period, it is suggested that ARFMI develop monitoring strategies that can determine the need for remedial action on artificially regenerated areas prior to assessing for FTG.

Table FMP-1 indicates 172,583 ha of Managed Crown Production Forest are below regeneration standards on the Cochrane Area Forest (33,311 ha are below regeneration standards on the former CMRMU). Assuming harvest and renewal rates were relatively equal over the past several years this equates to about 17,000 ha that require regeneration surveying annually; however Table FMP-25 indicates an average of approximately 11,000 ha is to be surveyed over the two-year period. The 2004 FMPM expects that the amount of area assessed for regeneration success "*should be consistent with the level of regeneration success required to meet plan objectives and the management strategy as well as levels of past disturbance (i.e., harvest and natural).*"

Recommendation 13: ARFMI must review the planned renewal assessment program in the 2010-12 CP to ensure that the next FMP covers the existing shortfall.

4.4 Plan Assessment and Implementation

Plan Assessment

The CMRMU consists mainly of lowland black spruce stands growing on organic soils overlaying clay; however portions of the Forest are quite different, for example there are some large outwash plains and undulating bedrock controlled topography. The current inventory is a reasonable approximation of the forest condition.

Site productivity over large portions of the Forest was noted to be quite variable due to nearness to the water table. Relatively small changes in elevation often led to significantly different forest types, even in very small blocks. This inherent variability was the cause of a significant audit finding related to the increase of less desirable tree species following careful logging in upland types. This is discussed within the silviculture (natural regeneration) sub-section below.

There was also a finding related to increased presence of larch following harvest. Larch trees are generally unmarketable and are being left standing for wildlife use. These trees are profusely seeding and thus are increasing in presence on the Forest. This was noted at recent harvest areas as well as in older areas declared free-growing and is discussed in the silviculture section below.

The increase in larch and other less commercially desirable trees is not being fully reflected in modelling nor discussed in the text of FMPs or annual reports.

Areas of Concern

A sample of AOCs were examined in the field where harvest activities had occurred during the period under audit, including AOCs to protect a caribou use area, tourism value and a moose aquatic feeding site. Examination of AOCs from the air and on the ground, as well as on supplementary aerial photography showed that AOC boundaries were maintained. AOC prescriptions afforded appropriate protection to the values and followed FMP and AWS direction.

Harvest

A helicopter and ground transportation was used to access the field audit sites and GPS technology was used to confirm navigation to and within sites. During the field audit a variety of sites were viewed but the majority were lowland spruce types. Pre-harvest forest types included mainly conifer-dominated and some mixedwood and hardwood stands. The field audit review included a selection of contractor work for each of the years audited. Due to the wet condition of most sites, the review was mainly of winter operations but several non-winter sites were also viewed.

Actual harvest levels were well below planned for the audit term due to the sector downturn. For the three-year period 2005-08, 47% of planned, pro-rated harvest was achieved. For the 2008-10 period, 23% was achieved. Harvest operations consisted of bringing full trees to roadside for processing. Roadside operations included round wood and pulp wood processing with in-bush chipping for pulp or bio-energy at a few sites proximate to the town of Cochrane.

Good harvest boundary control was noted during the field audit but there were a number of compliance inspection issues related to trespass during the audit term. Use of GPS technology by all contractors has improved boundary layout and decreased the size of incursions but issues remain. Compliance reports reviewed indicated slight inaccuracies in the digital map source data or occasional operator error as being the cause for the trespasses found. Some of these were into private land or unallocated area and some involved AOC incursions; most were very small. One contributing factor of this continuing compliance issue is that trespasses were often found by inspectors through review of supplementary aerial photography. This technique has become so effective that very small trespasses that would normally have been missed through field inspection are being identified. Reduction of incidence of trespass will occur through continuance of training and monitoring procedures already in place and improvements to the spatial accuracy of inventories and therefore no recommendation is made.

Bypass of timber was also minimized on sites viewed. Incidental merchantable pieces were noted in slash piles at some sites and merchantable stems used as pile ends were also noted at a number of sites but otherwise good to very good utilization was observed in most blocks; particularly in light of the small piece sizes in many blocks. Operators in the area are very proficient with careful logging techniques and little damage to residual trees was noted.

Site disturbance was minimized on most sites however it was noted at a few sites in the Chabbie Road area that operators occasionally worked past the frozen period and created localized site disturbance in lowland stands. These instances were not considered significant and therefore no recommendation is made.

Slash management in areas operated during the audit term mainly consisted of piling slash or leaving it un-piled. MNR had responsibility for the Cochrane sub-unit and Tembec was responsible for slash management on the Moose River sub-unit. Other than not implementing some of the strategies listed in the plans, the slash management work completed followed the FMP directions. What is not clear is why the 2003-08 FMP and 2008-10 CP contained slash management plans that could not meet the action plans developed to address the 1995-2000 IFA slash recommendations for the Cochrane and Moose River management units. Although FMP direction was generally followed during the audit term, the slash management program delivered was not considered effective by the audit team and did not fulfill prior IFA recommendations associated with action plans related to reducing slash. Further, the audit team believes that the slash management plan in the 2010-12 CP is inadequate to minimize the loss of productive Crown land and that it will not meet the intent of the related guidelines in the Stand and Site Guide.

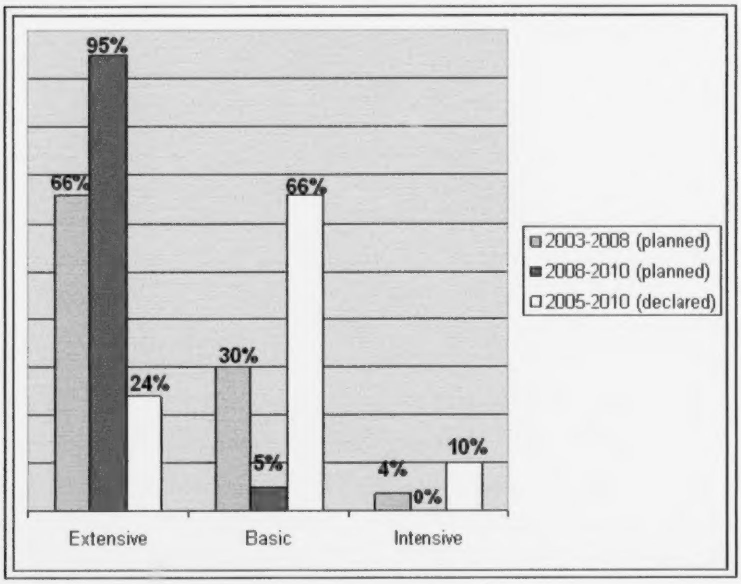
Recommendation 14: ARFMI must ensure the slash management plan in the 2012-22 CP can meet plan objectives and guidelines focused on minimizing loss of productive land.

Silviculture

The locations of renewal operations were consistent with the areas in the approved FMPs and AWSs. The majority of renewal treatments viewed during the field audit was found to be consistent with the associated FOP and suitable to the site conditions; however, the audit team had concerns with operational practices that are leading to decreased silviculture success/increased presence of less commercially desirable species on select sites. The increase is also inconsistent with the outcomes modelled in the 2010-12 CP. These concerns are discussed in detail in the following sections.

During the audit period 7,297 ha were harvested and 5,120 ha were declared as being regenerated. Regeneration intensity (Extensive, Basic or Intensive), as evaluated by actual treatments on the ground, deviated significantly from the intensities set out in the plans (Figure 3). The deviation in silviculture intensity was primarily due to under-achievement in harvesting during the term, which led to planting available seedlings on a higher proportion of area than would normally have occurred. Many planted areas were deemed Basic treatments due to lack of site preparation. It should be noted that due to silviculture monitoring deficiencies a significant amount of extensively treated area was not declared regenerated, resulting in a misrepresentation of implemented renewal intensity.

Figure 3. Actual regeneration intensity vs. planned intensity



Natural Regeneration

There was a significant underachievement in the amount of area declared naturally regenerated during the audit period. When pro-rated based on actual harvest levels during the audit term, about 16% was achieved. This low achievement is due to not accounting for/surveying all naturally regenerating areas during the audit term. The Monitoring section of this report includes a recommendation regarding underachievement in monitoring naturally regenerating areas.

Several natural regeneration sites were viewed during the field audit to assess the effectiveness of the treatment. Careful logging techniques were implemented on almost all areas harvested during the audit term. This system consists of alternating travel and protection corridors with a focus on minimizing the area traveled by machinery and disturbance to existing regeneration.

CLAAG and HARP (Harvesting with Advanced Regeneration Protection) are well suited to most of the lowland sites that dominate the area and sites viewed were found to have sufficient advanced regeneration spruce in the leave strips while site impact within harvest corridors was minimized, thus providing the requisite microsite for natural seeding or potential fill planting.

Careful logging viewed on most upland sites was deemed to be ineffective. Little advanced growth was present to protect in some areas and shrubs now dominate. In other areas regeneration mainly consists of balsam fir, balsam poplar and birch – species that are less desirable than the spruce and aspen harvested. The *Silvicultural Guide to Managing Black Spruce, Jack Pine and Aspen on Boreal Forest Ecosites in Ontario* deems the use of natural advance growth as NR (not recommended) for certain upland ecosites, and requires the implementation of silvicultural exceptions monitoring where it is employed. Considerable active renewal through chemical and/or mechanical site preparation, planting and tending will be needed to meet regeneration standards on some of these sites. Other sites will naturally renew to less desirable species. The 2010-12 CP SGRs no longer permit CLAAG or HARP on upland sites; however there is now a compliment of upland sites treated in this manner that will regenerate to poor quality stands unless remedial treatments are undertaken. Some sites will be too expensive to treat; however the effort should be made to identify and treat those sites where it is practical to do so.

Recommendation 15: ARFMI must:

a) conduct an immediate review of all upland sites harvested under the CLAAG or HARP system since 2003 and implement remedial silvicultural treatments, where practical, on sites found not likely to become a silvicultural success
b) implement exceptions monitoring on all upland CLAAG and HARP sites for which the use of natural advance growth (without planting) as a regeneration method is deemed as not recommended under the Silvicultural Guide.

It was evident through both field observations and a review of documents that larch is becoming more prevalent in some stands. Unmarketable, mature larch trees retained on cutover areas are effectively acting as seed trees and contributing to an increase in the larch component of regenerating stands. Some transition from SBC (black spruce CLAAG forest unit) to LC1 (lowland conifer forest unit) is planned for in FMP modelling; however, as evidenced by annual reporting, the Trend Analysis Report (TAR), and audit findings, SBC sites are becoming LC1 at much higher rates than predicted due to increased larch content.

In addition, and as discussed previously with regards to careful logging and regeneration protection on upland stands, the increased presence of other less desirable tree species such as balsam fir, balsam poplar and larch is common. The main issue, and source of the audit team's concern, is that transition of significant amounts of area from forest units dominated by preferred tree species to those with less preferred tree species is a threat to forest sustainability.

Recommendation 16: ARFMI must address the increased presence on the Forest of less desirable tree species such as larch and balsam fir.

Planting and Seeding

During the audit period 84% of the planned planting area was treated (3,694 ha); considering the under-achievement in harvest during the term this is considered an accomplishment. Most of the planting (88%) took place during the last three years of the 2003-08 FMP. During that period 3.7 million trees were planted on 3,241 ha - an average density of 1,147 trees/ha. A total of 452 ha were planted during the 2008-10 period using about 730,000 seedlings – an average planting density of 1,621 trees/ha.

Overall, planting quality and quantity was sufficient to meet regeneration standards in the SGRs and FMP direction; however the audit team found areas where improvement is needed. Due to the predominance of clay soils on the unit there is a reluctance to use site preparation and direct planting is preferred. Direct planting can often result in lower densities due to planters having difficulty finding suitable planting spots and planted trees quickly succumbing to heavy competition. Auditors observed areas which were planted to densities well below regeneration standards.

Inconsistent seedling spacing is also normally found in directly planted areas and this was evident at a number of audit stops – where conditions were good, seedlings were sometimes planted at very tight spacing; otherwise, seedling density was low. Tembec has clear and detailed work instructions in place related to seedling stock handling, screefing, selecting suitable planting spots and operational safety for planters; however many sites are not conducive to direct planting, particularly if there is excessive harvesting slash or duff. In these cases ARFMI should consider the use of site preparation to increase available planting spots.

Aerial seeding operations conducted during the term were found to be consistent with the FOP and appropriate for the site conditions. Jack pine seeding on upland sandy soils was found to have sufficient stocking and species composition to meet the SGR.

Site Preparation

Site preparation operations were conducted on 1,032 ha during the term (71% of planned). Most was mechanical site preparation (743 ha - 72%) and the remainder was chemical – this ratio is consistent with planned. About three-quarters of the recorded mechanical site preparation was slash piling (557 net ha). The remaining site preparation consisted of power trenching (115 ha) and about 70 ha of shear-blading. The 185 ha of actual mechanical site preparation operations, not including slash piling, was an under-achievement during the audit term (33% of planned).

Power trenching operations, albeit limited, were found to be well done creating sufficient seedbeds for the successful implementation of the aerial seeding prescription. Shear-blading was viewed on a single site and was determined to effectively reduce slash load while minimizing ground disturbance.

The company contends that the limited use of mechanical site preparation was due to the following:

- The predominance of clay soils types which have the tendency to heave seedlings from the soil during the frost period.
- Sites which were prescribed for planting during the term had low levels of duff and/or debris

Increased potential for seedling heaving may be true when using traditional scarification tools (power trenching, deep blading); however, intermittent patch mounding in heavy clay soils has been proven to be effective in many jurisdictions and provides many quantifiable advantages compared to direct planting (decreased heaving, deciduous competition control, raised microsite, increased nutrient availability/seedling growth, etc.). One of the blocks viewed during the field audit (Kennedy 32) was found to have low planting density (about 400 trees/ha) due to deep duff and limited planting spots.

Properly implemented site preparation provides planting spots of the quality and quantity needed to meet regeneration standards. It is suggested that ARFMI consider the use of alternate scarification tools to maximize site productivity and increase planting densities in areas with thicker duff layers; this could also allow for decreased herbicide use, particularly in areas prone to invasive grasses.

Chemical site preparation was conducted on 328 ha. Chemical site preparation effectively reduced competition to seedlings on the sites viewed.

Tending

A representative sample of tending operations that occurred during the term was examined for effectiveness in the field and related documents were reviewed to assess compliance with regulations and planned operations. During the audit period 90% (4,982 ha) of the planned area for tending was treated; 75% of this occurred during the last three years of the 2003-08 FMP. Tending activities included treatment of 1,279 ha of barren and scattered and not sufficiently regenerated lands.

Tending during the term consisted of aerial application of herbicide; no manual tending was done. The chemical products Vision and Forza were used on the Forest. Due diligence was followed by the company to ensure compliance with all relevant rules and regulations of chemical application. Chemical was judiciously applied to appropriate sites, conifer was released from competition as prescribed and spray boundaries were generally followed; however, some occurrences of overspray, drifting, striping and areas where the spray was ineffective were viewed during the field audit. Spray issues were confirmed by MNR during interviews, in annual silvicultural effectiveness monitoring reporting and FOIP reports.

In 2007 Tembec implemented a regional program to identify ongoing spray effectiveness issues and develop actions to address them. The program was found to be comprehensive in terms of addressing past operational deficiencies while increasing requirements for operational controls and staff/contractor training and awareness. Additionally, joint annual reviews of MNR silviculture effectiveness monitoring findings has helped Tembec identify spray program issues and develop appropriate strategies to address them. Tembec has acknowledged issues with the chemical spray program and suggests that plant drought condition may be correlated to glyphosate efficacy; this is to be investigated through the Forest Research Partnership. It is suggested that ARFMI continue research into factors affecting chemical efficacy.

Renewal Support

Tree improvement activities, seedling production, cone collection and available seed inventory was examined during the audit. Orchard maintenance activities were the only tree improvement activities conducted during the audit period. Seed and planting stock production and seed inventory levels during the term were consistent with forecast levels in the FMP.

As mentioned in the planning section, issues relating to succession planning for tree improvement sites was noted. ARFMI has expressed concern in continuing the investment in the tree improvement program given that future gains provided through the use of improved seed are largely negated in areas affected by long-term harvest deferrals. Careful consideration of the total area on the Abitibi River Forest affected by long term harvest deferrals and the predominant planned method of renewal (artificial vs. natural) for those areas should to be considered when determining future improved seed requirements. White Spruce seed is subject to annual sorting and enhancement treatments. ARFMI has indicated that seed enhancement/sorting treatments results in satisfactory germination rates (85%).

Access

Field examination of access development and maintenance included a sample of roads, water crossings and aggregate pits operated in the five-year period. As well, the sample included road construction and maintenance activities performed under the roads agreement for the management unit. All activities were found to have been performed in accordance with related requirements and consistent with the FMPs and AWSs.

4.5 System Support

Financial challenges faced by the SFL holders during the audit term led to high rates of personnel attrition and companies encountered unprecedented demands to restructure. Given these circumstances, the professionalism of remaining staff prevented a complete collapse of the forest management system.

The audit team has some concerns about the adequacy of the system support in place during the term of the audit. System and staffing support issues where determined to be a primary contributor to the key audit finding relating to silviculture monitoring (see silviculture monitoring section). During the field audit it was evident that silvicultural records were incomplete and poorly organized, raising concerns about the completeness of records transferred to the new manager. A review of some of the systems and issues associated with the challenges of the amalgamation is recommended in section 4.1 (Recommendation 3: Appendix 1).

FRMG, a newly formed company contracted by ARFMI to deliver forest management services on the Abitibi River Forest, is based upon the systems and personnel associated with the Timiskaming Forest Alliance Inc. which has a proven management track record. Time will tell how well these new systems will work in the new environment. To assist in the transition, the audit team suggests that ARFMI continue its efforts to capture local experience and knowledge in the new management systems being developed by FRMG. As an example, several foresters, retired or operating as independent contractors, were retained by ARFMI to assist in field portions of the audit. This proved to be effective and efficient in facilitating the audit.

4.6 Monitoring

Silviculture

Tembec's entire silviculture effectiveness monitoring (SEM) system was evaluated during the audit. Focus was on determining whether the system allows for monitoring the effectiveness of all silvicultural treatments, identifies areas in need of remedial actions and determines conformance of operations to the selected management alternative of the FMP. The program includes pre-harvest surveys and post-harvest/CLAAG surveys, informal tending surveys and FTG assessment.

It was determined that Tembec has comprehensive silviculture monitoring procedures in place but there were issues implementing the program and some components lack rigor. Specifically, there was:

- A significant shortfall during the audit term in terms of the organization and execution of the SEM program;
- An underachievement in monitoring and informal monitoring completed with no records;
- Inconsistent data entry.

At the time of the field audit, none of the staff who directly managed the silviculture program during the audit term were still employed by Tembec so information available to the audit team regarding the monitoring program implemented was limited.

As noted in the Plan Assessment and Implementation section, there was significant underachievement in the amount of area declared naturally regenerated during the audit period - only 16% when pro-rated to actual harvest. This is due to underachievement in monitoring of naturally renewing sites during the audit term – the 2010 TAR for the CMRMU notes that "*It is apparent that reporting on natural regeneration was postponed into the next period*".

Recommendation 17: ARFMI must implement an effective silviculture monitoring system, complete the assessment of naturally regenerating backlog areas, and report areas planned for natural regeneration within the timeframe specified in the FMPM.

During the audit period 29,887 ha were surveyed to assess FTG status; this was an overachievement when compared to planned values (139%). The majority of the FTG surveys were completed by Tembec staff using the extensive survey methodology via helicopter. MNR actively participated in the FTG assessment through their SEM program and joint FTG flights later in the term. About three-quarters of the area assessed were found to be FTG. The remaining area was deemed not sufficiently regenerated (NSR) and generally required additional height to achieve minimum standards or tending to remove competing competition.

FTG status varied between the harvest and natural depletions. Regeneration success - meeting minimum stocking and species requirements but not the intended forest unit – was 73% over all the area surveyed but was 81% on harvest depletions and only 42% on naturally depleted areas. The low regeneration success on naturally depleted areas suggests more time was needed before surveying these areas.

Silviculture success - meeting minimum stocking and species requirements as well as the desired forest unit – was 48% overall but also varied between harvest and natural depletions (54% and 23% respectively). Based on interviews and document review, the low silviculture success was associated with one of three factors: older harvest areas did not have specific forest operation prescriptions; inadequate herbicide application; or retention of advance growth on upland CLAAG sites.

A representative sample of area declared successfully regenerated was viewed during the field audit and actual FTG calls were compared to field observations. Species and stocking calls audited were found to be generally consistent with the inventory data. The audit team found some discrepancies with respect to species composition and stocking; however, the overall accuracy of the FTG data for areas sampled was found to be satisfactory. In addition, FTG field tally sheets were compared for consistency with inventory information to check for data transfer errors; none were found.

The MNR District implemented a comprehensive SEM program during the audit term. MNR assessment results were compared to company submissions and SEM results were presented to Tembec. Follow-up action plans were drafted and implemented to address identified shortcomings. The audit team found that MNR district staff participated actively and jointly with Tembec staff in addressing and working towards solutions for identified shortcomings in the FTG survey program. MNR's SEM work during the audit term was determined to be excellent and is deemed a best practice. The audit also determined that MNR completed outstanding work with regards to compliance monitoring (see next section). This Best Practice was developed to recognize both of these areas of excellence.

Best Practice 2: The monitoring of silviculture effectiveness and compliance by the Ministry of Natural Resources during the audit term was deemed to be excellent.

Compliance

Tembec produced a strategic Compliance Plan for the Cochrane Moose River 2008-10 CP. A strategic Compliance Plan was also developed for the 2010-12 CP for the amalgamated forests. These documents were approved with the signing of the respective CPs, well in advance of operations commencing. The compliance plans were well written and met all requirements including a description of compliance goals, priorities and strategies as well as reporting responsibilities. Acceptable annual compliance plans were also produced by Tembec for each AWS during the audit term.

MNR completed an Annual Compliance Operating Plan (ACOP) for each year during the audit term. The ACOPs reviewed were well written and included a comprehensive forestry section that discussed goals and compliance priorities. AWS planned compliance activities were prioritized (low, medium or high risk) through a ranking system developed by MNR and operations sampled accordingly. All known non-compliant activities and public complaints were also targeted for inspection.

The ACOPs are reviewed informally each quarter by MNR to determine progress, with more formal reviews done at least twice a year, including a six-month and year-end summary. District Compliance Advisory Team meeting minutes captured the six month review notes while year-end summaries were produced to describe actual compliance activities that took place.

MNR also has a 'Compliance-at-a-Glance' worksheet that links start-up notification with monitoring targets by block. The worksheet is also used to keep track of inspection status and issues. This is deemed a very good resource for the inspectors.

Review and dispersal of compliance information is completed through two forums:

- District MNR compliance staff meets quarterly as the Forest Advisory Team.
- Joint industry/MNR compliance meetings occur as needed

These forums provide for necessary dissemination of information and discussion regarding compliance.

In addition, an inter-district protocol was developed to define the roles and responsibilities of the three MNR districts that service the Abitibi River Forest. The protocol was well conceived and pertinent portions regarding MNR roles/responsibilities should be brought into the next FMP to provide clarity and connectivity between these documents.

According to the compliance plans, Tembec was responsible for completing compliance inspections on their operations, while Norbord was responsible for inspecting their operations. MNR was responsible for planning, monitoring, reporting, and education/prevention requirements as well as completing inspections for independent operators on the Cochrane sub-unit. Compliance reporting audited confirmed that the responsible parties completed inspections and other requirements as per this arrangement.

Company compliance reports viewed were generally timely and included required text regarding observations. It was noted that pictures/scanned maps, etc. were not normally included in company reports. Although not required, these visual aids can add perspective/clarity and should be considered for inclusion in future reports. MNR reports viewed were comprehensive and included digital pictures and scanned maps as necessary to aid in discussing inspection findings. However, MNR reporting was often tardy. MNR has a protocol in place that requires inspectors to provide the District Supervisor with a form for each late report that notes the number of days the report was late and the reason(s). MNR listed tardy reports as an area in need of improvement in the most recent version of the ACOP so no recommendation is made in this audit.

On-the-ground joint inspections rarely occurred during the audit term. While the joint office meetings provide a good forum for discussing compliance, joint on-the-ground meetings are most effective for discussing actual operational issues, etc. MNR has also determined that joint inspections should be encouraged and has listed this as an area in need of improvement in the ACOPs. The audit team concurs but since this is already identified as needing improvement, no recommendation is made herein.

Industry and MNR inspectors completed 340 inspections during the audit term; industry completed 228 and MNR 112. The number of inspections completed was determined to be satisfactory based on the reduced level of activity during the audit term. MNR's rate of identifying non-compliances was significantly higher than the company rate (18% vs. 5% for actual non-compliant activities). Through a review of reports and interviews with MNR and industry staff it was determined that company inspectors tend to use 'in compliance with comments' more than MNR and this may be a reason for the large discrepancy in reported compliance status.

Recent changes to the compliance program remove the requirement for the industry or MNR inspector to make a specific determination of compliance versus non-compliance; instead the focus is operational issues found. How these issues are managed will determine the compliance outcome. Compliance status will be determined by the presence or absence of operational issues and, where operational issues are identified, by the outcome of the MNR led issue management process. Therefore, the changes made to the compliance program will reduce/eliminate the variability in reporting of compliance so no recommendation is made in this audit.

All non-compliances identified during the term were categorized as minor and included minor trespass into unallocated areas, AOCs and private land as well as exceeding right-of-way widths on a number of roads. Some utilization and licensing issues were also found. A few silvicultural non-compliances also occurred related to planting and spraying outside approved boundaries.

When operations were suspended during the audit term for a period greater than 20 working days, suspended operation reports were completed. According to FOIP, as of early October 2010 there were four suspended reports; one suspended in October 2008 is now overdue according to the Compliance Handbook direction update of April 1, 2008. This report relates to wood left on a right-of-way of a road that was not constructed "*because it now falls within the proposed caribou deferral zone identified by Tembec and the MNR.*" The wood quality has deteriorated and Tembec has had difficulty finding a market for it. According to the Issue section in FOIP this issue was dealt with in April 2010 but the compliance report is still classified as suspended in FOIP. This FOIP report should be updated according to compliance remedies that have occurred.

According to records and interviews, Tembec delivered an effective prevention/education program during the audit term. Tembec's program is based on the ISO 14001 and FSC certification framework, which have rigorous requirements regarding developing, delivering and documenting prevention and education programs. Included in the program are health and safety policy and procedures, compliance training and monitoring procedures, roles and responsibilities, as well as specific work instructions for all forest operations. Tembec staff was found to be well trained.

MNR also delivered an effective prevention/education program for staff during the audit term. Staff is well trained and effectively completed required tasks. The thorough, well-conceived compliance monitoring protocols put in place and being implemented by MNR demonstrates the competence of the staff. As noted in the prior section, a Best Practice was given for the silviculture effectiveness and compliance monitoring work completed by MNR during the audit term.

Annual Reports

Annual reporting during the audit term was fairly well done. The ARs were generally well written, numbers in text and tables were typically in agreement and 'to date' summaries were usually correct; however there were some variances between text and tables. The variances are small and not considered significant to warrant a recommendation.

The ARs met FMPM requirements and based on the field audit, the activities conducted during the term, including monitoring and assessment, were correctly summarized in the ARs. One finding is that Tables AR-14 (2004 FMPM) and AR-13 (2009 FMPM) report low (less than 55%) silvicultural success, contrary to field observations.

In the FMP, based on the intensity and silviculture treatments planned, multiple pathways are available and modelled to allow current forest units to become a number of future forest units. In AR tables 13 and 14 only a one-to-one relationship is reported. Thus, in the audit team's view, there is an issue with the use of multiple-pathway modelling for the FMP and single-pathway reporting in these AR Tables. This discrepancy will lead to a breakdown in the adaptive management cycle since results being tabled in ARs cannot inform the planning team for the next FMP. In addition, low silviculture success ratios currently derived by the reporting format may send the wrong signals to policy makers and the general public.

Recommendation 18: Corporate MNR must review the reporting procedures and consider modifying them to recognize multiple successional pathways to improve the adaptive management process.

4.7 Achievement of Management Objectives and Sustainability

Year 10 Annual Report

The Year 10 AR prepared by Tembec (2007-08 CMRMU AR) generally met reporting content requirements. MNR conducted a review of the report and provided a list of comments that were addressed in preparing the final version of the Report. Trends were presented and interpreted where data permitted and knowledge gained from implementation of the 2003-08 FMP (e.g. accuracy of yield estimates) was discussed. The low level of harvest was cited as a complicating factor in the assessment of modelled outcomes vs. actual achievement for a number of aspects. The Year 10 AR formed the basis for preparation of the Trend Analysis Report, discussed below.

Trend Analysis Report

FRMG prepared the Trend Analysis Report (TAR) for the CMRMU. The audit team reviewed the report and noted some deficiencies; FRMG submitted a revised report. Some data in the final TAR contains minor differences in reported values compared to those in the ARs but the differences are not considered materially significant. Otherwise the TAR generally met IFAPP requirements. The TAR (see Appendix 7) covered the years 1993-94 to 2008-09. The TAR author accurately notes that changing forest units from plan to plan make establishing meaningful trends difficult.

Total harvest area was 62% of planned representing a cumulative undercut of approximately 28,000 ha over 15 years. Undercut levels were experienced in all forest units. Underachievement of harvest volumes was also experienced in all species but jack pine. Tree planting levels were approximately 80%

of planned and seeding was 100% of planned. Site preparation exceeded planned levels by nearly 40%. Tending also exceeded planned levels by over 15%.

In the five years from 2003-2008 approximately 32,000 ha was assessed for regeneration status of which 21,800 ha (69%) met regeneration standards. Fifty per cent of that was reported as a silvicultural success (e.g. regenerating to the projected forest unit). In terms of overall regeneration trends, total area regenerated compared favourably to total area harvested between 1993 and 2008 (47,555 ha cut vs. 53,715 ha regenerated). Four of seven forest disturbance size classes have showed no movement towards projected frequency. The TAR author found that plan objectives were generally met. Some conclusions are based on modelled outcomes being within acceptable tolerances (e.g. forest diversity, wildlife habitat). The TAR author concluded, while acknowledging data limitations for some indicators, that ...*implementation of planned operations has provided for the long-term sustainability of the Crown Forest.* This conclusion was based on the status of a number of aspects including the achievement of management objectives and progress on implementing the 2005 IFA action plan. While the downturn in the forest industry was acknowledged as a key factor in the underachievement of the harvest objective it was noted that the productive forest area remained generally stable; two of three Aboriginal communities were involved in the special Native consultation process, silviculture spending was close to or above FMP estimates and value added (direct, indirect and induced) from forestry activities was approximately $100 million.

Achievement of Management Objectives

Appendix 2 provides a tabular analysis of the audit team's assessment of progress towards achieving the objectives set in the 2003-08 FMP and the 2008-10 CP for the CMRMU. It summarizes the audit team's assessment of the extent to which the objectives were achieved including the rationale, particularly where objectives are considered not to be met. Cross-reference is made to relevant recommendations and best practices.

Of the four objectives not met, two were associated with inadequate slash management and deficiencies in completing post harvest surveys, analysis and reporting of results of CLAAG and HARP treatments. The remainder lacked evidence to demonstrate that targets were achieved. Slash was the principal reason that several objectives were only partially met while silvicultural practices contributing to an increase in less desirable tree species, and delays in approval of the planning inventory were the source of the others.

Forest Sustainability

Forest sustainability (i.e. achieving plan objectives and the long term management direction set for the forest in the FMP) was generally met based on the findings of this audit. The audit team also concurs with the observations and comments of the TAR author in this regard. The economic downturn and associated impacts have significantly constrained the ability of the forest managers to achieve planned harvest levels (e.g. 23% of planned in 2008-10 CP) and, as a consequence, the social/economic objectives will not be fully realized. Forest cover-based objectives will not be achieved at planned rates but renewal programs have kept pace with the harvest and forest development is proceeding in the desired direction for the most part. However, there is a particular need to address the inappropriate application of CLAAG and HARP harvest prescriptions on some sites which is contibuting to degraded stands through increased levels of undesirable species such as balsam fir and larch. As well, the loss of productive forest area along roadways to waste wood fibre, a provincially significant issue, must be resolved.

4.8 Contractual Obligations

For the purposes of the IFA, contractual obligations associated with Crown Management Units fall into three categories: payment of monies to the Crown and Forestry Futures Fund, response to recommendations arising from the previous IFA, and funding/implementation of the renewal program. Appendix 3 summarizes the individual conditions arising from the SFL and provides the audit team's assessment of the extent to which each licence condition was met. All obligations were considered met or partially met other than those associated with previous IFA audit action plan and status report (see Table 2). The Audit Action Plan to address the recommendations from the 2005 IFA met the content requirements of 2005 IFAPP; however both it and the subsequent Action Plan Status Report were submitted well past the required dates.

Recommendation 19: The Cochrane District Manager must ensure that submission timelines for IFA Action Plans and Status Reports are met.

As part of the review of contractual obligations, the audit team is required to assess the effectiveness of actions developed by the auditees to address the recommendations arising from the previous IFA. The Action Plan Status Report was finalized in September 2010 and provided to the audit team. The Status Report included action plans for each of the 18 recommendations and three suggestions from the 2005 IFA as well as findings from an internal review led by MNR Northeast Regional Office Field Services Division Northeast Regional Office, which was conducted during the week of December 15-19th, 2008. The internal review ensured that the previous audit findings were addressed, identified shortcomings in action plans and made suggestions for improvement. The audit team felt the internal review was well done and beneficial. It was apparent from the Status Report, the Field Services Division Internal Review and other documentation, as well as interviews and field observations that considerable work had been undertaken on the 2005 IFA action plan; however, the audit team found shortcomings in meeting the timelines set for certain recommendations.

Table 2. Recommendations from the 2005 IFA not satisfactorily or fully addressed.

Recommendation	Audit Team Assessment
15. The District Manager needs to ensure that staff adheres to information requirements and timelines for the Independent Forest Audit.	The auditee failed to meet the timelines set in the IFAPP for the submission of the audit action plan and status report and in the 2005 IFA report for the submission of the interim action plan status report. See Recommendation 19
16. The Cochrane District Manager must action the outstanding recommendations from the previous IFA for completion within 6 months of the date of the submission of the 2005 IFA Report.	Generally met in terms of addressing the audit recommendations but not met within the 6 month deadline. See Recommendation 19
17. Corporate OMNR must direct the Cochrane OMNR District Manager to fully address all recommendations in this report within 24 months. At that time, an internal OMNR review should be conducted to determine if all past and present IFA recommendations have been addressed. The findings of the internal review should be provided to the Forestry Futures Committee and the OMNR Deputy Minister.	Generally met in terms of addressing the audit recommendations and conducting an internal review but not met within the 24 month deadline. No record was found to demonstrate that a copy of the internal review was provided to the Deputy Minister. See Recommendation 19

4.9 Conclusions and Licence Extension Recommendation

Of the 19 audit recommendations arising from this audit there are three areas of concern that are considered key since they highlight the need to significantly alter certain current practices on the forest in the interest of sustainability. The first area of concern arises from the lack of clear direction from the Province that has allowed forest operations to leave significant amounts of waste wood fibre (slash) at roadside where it occupies productive forest land and prevents establishment of regeneration. This practice is not unique to the CMRMU or the amalgamated Abitibi River Forest; management of waste wood fibre (both slash and chipper debris) has been a recurring issue for years as evidenced by the many recommendations made in previous IFAs across Ontario. Only a change at the Provincial policy level, supported by forest management plan commitments and enforcement of such commitments through the Provincial compliance program is likely to lead to an effective, permanent solution. The second area of concern is associated with implementation of harvesting patterns that protect existing regeneration on upland sites. In the audit team's view this practice will lead to degrading of future stand composition through retention of less desirable species that will form a higher component of the new stand, and reduced productivity due to the inherently higher levels of competition on upland sites, resulting in lower stocking levels. A third related area of concern is the retention of mature larch seed trees in harvest blocks which is also contributing to a significant increase in the larch component on lowland sites.

The audit team concludes that management of the Cochrane-Moose River Management Unit was generally in compliance with the legislation, regulations and policies that were in effect during the term covered by the audit, and MNR met its legal obligations. Forest sustainability is being achieved, as assessed through the Independent Forest Audit Process and Protocol.

No recommendation is made on licence extension since a new licence with a twenty year term was issued to Abitibi River Forest Management Inc. for the Abitibi River Forest in August 2010. A recommendation on licence extension will occur at the next IFA.

Appendix 1 – Recommendations

Independent Forest Audit – Record of Finding

Recommendation 1

Principle: 2 – Public Consultation and Aboriginal Involvement

Criterion: 2.1 – Local Citizens Committee (LCC)

Procedure: Assess establishment of the LCC. This will involve a review of the terms of reference and LCC minutes, compared to the applicable FMPM requirements.

Background Information and Summary of Evidence:
The 2004 FMPM requires that the LCC Terms of Reference be prepared (or updated for an existing committee) at the beginning of Phase I planning. The Cochrane LCC Official Terms of Reference (updated in March 2006, March 2007, March 2008 and January of 2009) was reviewed. Section 3.2.4 of the 2004 FMPM lists content requirements for the Terms of Reference for the LCC. The following items were either not included or not adequately addressed in the Terms of Reference for this audit period:

- Item (a) – the name of each committee member and his/her affiliation
- Item (b) – the date of each member's appointment to the committee
- Item (c) – the roles and responsibilities of the committee, and individual committee members, including how each committee member will report back to and/or obtain input from the constituency he or she represents
- Item (i) – background material and training required to assist committee members with their roles and responsibilities and forest management planning matters

Discussion:
The LCC terms of reference form part of the public record. It should be an accurate snapshot of the committee at the time it is updated and meet the requirements of the FMPM. Much of the content required by the FMPM also serves to aid the committee members in fulfilling their roles and responsibilities to the committee, particularly for new members.

Conclusion:
The LCC Terms of Reference do not currently meet the content requirements of the FMPM.

Recommendation 1: MNR District must ensure that the LCC Terms of Reference are updated to meet the content requirements of the FMPM.

Independent Forest Audit – Record of Finding

Recommendation 2

Principle: 3 Forest Management Planning

Criterion: 3.1.2 Planning Team and Advisory Groups

Procedure: Assess the effectiveness of the Planning Team and advisory groups

Background Information and Summary of Evidence:
A review of the 2010-12 CP and Supplementary Documentation, interviews and questionnaires determined that FMPM procedures were followed but the Planning Team encountered delays in meeting some checkpoints (i.e. planning inventory and base model) early in the planning process for the 2010-20 FMP. These delays and concern over the implementation of the pending Caribou Conservation Plan under the Endangered Species Act (2007) led to a determination by the Steering Committee that a Contingency Plan would be required.

Discussion:
The reasons for going to a Contingency Plan were properly documented in the Contingency Plan proposal; however, the Steering Committee only met twice, contrary to the Terms of Reference which called for quarterly meetings. No minutes were recorded for those meetings. There is a need to improve communication between the Planning Team and Steering Committee in future planning efforts. For example, two planning team members were not certain why a contingency plan had been called for late in the planning process

Conclusion:
The Steering Committee plays an important role in the planning process and minutes of meetings and correspondence should be maintained and included in the Supplementary Documentation section of the FMP. The audit team believes that there is a need to improve communication between the Planning Team and Steering Committee in future planning efforts.

Recommendation 2: MNR Cochrane District must ensure that the Steering Committee meets as required during the development of the 2012-22 FMP and that minutes for those meetings are recorded, distributed to planning team members and included in the FMP supplementary documentation.

Independent Forest Audit – Record of Finding

Recommendation 3

Principle: 3 Forest Management Planning

Criterion: 3.3 Management Unit Description

Procedures: 3.3.3.1 – 3.3.5.1 The IFAPP devotes eight criteria and 13 procedures to the assessment of the management unit description section in an FMP.

Background Information and Summary of Evidence:
The CP was prepared consistent with the approved Proposal's table of contents that excluded the forest management unit description section. The previous CP for the CMRMU had a forest management unit description section. The FMPM states "*A Contingency Plan is an interim forest management plan that is required when special circumstances affect the implementation of a forest management plan*". The 2010-12 CP does not contain a forest management unit description section.

Questions emerge from this amalgamation that deserve further consideration. For example, since all of the forests had data that met the Forest Information Manual (FIM) requirements, why did it take such a lengthy period of time to develop the planning inventory? Are there problems with FIM or were there inadequate resources to bring the inventory together? Why does the MOE and MNR not consider a forest description for a new forest to be important in a Contingency Plan? Are there redundancies in the planning manual describing the required content of a management plan?

Discussion:
A new forest created through amalgamation should have an interim forest management plan that actually describes the new forest. Although the current condition section of the CP and supporting documentation describe many important elements of the Forest, this is a function of some redundancies in the FMPMs (1996-2004) and does not explain why an important context setting section of the CP was not seen as being necessary by those proposing and approving the Contingency Plan proposal.

The plan under development for 2012 is already considering a Contingency Plan requirement for its first year of operation. No doubt the plan will have the required forest management unit description section. But these irregularities arising from a complex amalgamation of several forests creates problems that will be encountered on a grand scale if the proposed tenure and pricing reforms lead to large amalgamations across the Province. In addition to planning issues, amalgamations have other issues such as how LCCs are formed, how roles are distributed among District offices and how "trends analyses" are interpreted.

In addition, the reasons for a Contingency Plan, such as the delays in planning inventory approval, deserve review. Assuming all forests met FIM criteria, the audit team questions why there were problems in combining data sets. These questions merit attention by Corporate MNR to ensure the planning support system is functioning properly.

Conclusion:
The unusual circumstances surrounding the 2010-12 CP deserves further review and a report on lessons learned to better inform future amalgamations.

Recommendation 3: Corporate MNR, in consultation with the Ministry of Environment, must investigate and report upon lessons learned in the amalgamation and associated planning challenges encountered in the creation of the Abitibi River Forest to ensure information management systems and other procedures are adequate to deal with future amalgamations.

Independent Forest Audit – Record of Finding

Best Practice 1

Principle: 3 Forest Management Planning

Criterion: 3.4 Proposed Long-Term Management Direction

Procedure: Assess achievement of the checkpoint for portions of the FMP relevant to habitat classifications

Background Information and Summary of Evidence: The 2010-12 CP provides considerable discussion about woodland caribou. The LTMD with respect to caribou is comprehensive and is supported by Supp Doc 4. Caribou Strategy (Forest Dwelling Woodland Caribou Protection In the Cochrane Area Forest). The LTMD focuses on caribou in four sections: 3.2.3.6 Historic Caribou Habitat; 3.2.3.7 Caribou Habitat Description; 3.2.3.9 Spatial Caribou Habitat; and, 3.2.3.10 Marten, Caribou and Marten/Caribou Core Areas.

The primary data source for spatial decisions related to caribou was the ongoing multi-partner research initiative established to study woodland caribou habitat and range use. The study was initiated in 1998 and involves collaring caribou cows with GPS radio-collars that track animal movement which, when plotted with habitat, roads or other landscape features, help to gain understanding of caribou response to management decisions and strategies.

Discussion:
The caribou study has contributed significantly to knowledge of caribou movement and range use in the area. Knowledge gained from this study has contributed to FMPs including 2010-12 CP. The intent is to collar another 30 caribou bringing the number to 50 and to collar more wolves to bring the number to 36 in six to eight packs.

Conclusion:
The knowledge base provided by this study is invaluable for integrating caribou habitat and range needs with forest management planning.

Best Practice: The ongoing multi-partner woodland caribou study is an excellent example of applied research that has provided and continues to provide significant science-based contributions to forest management planning.

Independent Forest Audit – Record of Finding

Recommendation 4

Principle: 3 Forest Management Planning

Criterion: 3.4.1.4 FMP achievement of the Checkpoint *Support for Proposed Management Strategy*

Procedure: 1. Assess progress towards achievement of the checkpoint by reviewing the results of the desired forest and benefits process

Background Information and Summary of Evidence: The Abitibi River forest is an example of a forest operating at a scale more consistent with the Forest Management Guide for Boreal Landscapes. Such a scale should allow for better solutions to landscape-level issues. However, the reporting of various forest cover indicators at this large scale may come at the expense of localized issues such as representation of certain forest cover types within some management sub-unit locations.

Discussion:
Other models like Patchworks allow these trade-offs to be more transparent at different scales of resolution compared to SFMM. Patchworks was used to help explore these trade-offs during the development of the Forest Management Guide for Boreal Landscapes. This guide is soon to be released and will be used in the development of 2012 forest management plans

Conclusion:
Given the pressure on wood supply and non timber values, the preparation of forest management plans on amalgamated forests would benefit from a more careful analysis of trade-offs at different scales using additional decision support tools such as Patchworks.

Recommendation 4: Corporate MNR must consider requiring that trade-off analysis be conducted using an appropriate decision support tool on amalgamated forests.

Independent Forest Audit – Record of Finding

Recommendation 5

Principle: 3 Forest Management Planning

Criterion: 3.5.5 FMP harvest and natural depletions

Procedure: Review the applicable FMPM requirements related to planned clearcuts, including planned clearcuts that exceed 260 ha, and assess whether

- there is appropriate silvicultural or biological rationale for planned clearcuts that exceed 260 ha

Background Information and Summary of Evidence:
A listing of planned clear cuts >260ha and specific biological or silvicultural rationale for these larger planned cuts is to be provided in Table FMP-16. In the 2010-12 CP in many cases there is no rationale for the planned cuts and often the text has been truncated (possibly a result of formatting into pdf). For example, the following rationale is provided for Block 300 (note the truncated final sentence): "*The planned harvest block is located in the Marceau area of the TBS sub-unit. The block is composed of mostly lowland black spruce areas and includes a large amount of forecast depletion area which will not be cut before April 1, 2010. Both the NDPEG in*".

Discussion:
The 2009 FMPM still requires biological or silvicultural rationale be provided for planned cuts >260ha.

Conclusion:
The following recommendation is made to ensure the next plan meets the requirements.

Recommendation 5: ARFMI must ensure that the next FMP contains biological or silvicultural rationale for planned clear cuts greater than 260 ha.

Independent Forest Audit – Record of Finding

Recommendation 6

Principle: 3 Forest Management Planning

Criterion: 3.5.1 FMP areas selected for operations

Procedure: 3.5.1.1 Review areas selected for operations and assess whether

- the FMP selects areas for harvest, consistent with the AHA by forest unit and the selection criteria

Background Information and Summary of Evidence:
Planned harvest in the 2010-12 CP for the Abitibi River Forest closely mirrors the projected/forecast harvest area - about 38,000 ha is planned for harvest over the two-year term. About 9,000 ha of the allocation (~24%) is in younger aged stands than modelled. This is considered a significant level of age class substitution.

The age class substitution is rationalized in the CP as necessary due to re-allocating stands not harvested in the previous plans (mainly the 2005-10 Iroquois Falls FMP), focusing allocations away from contentious areas (including all stands in the caribou zone) and for operational and access considerations. The substitution is further rationalized – "*the younger for older age class substitutions for the planned harvest area are not expected to impact the long term sustainability as future harvesting during the 2010-20 term will be expected to move to these older areas as much as possible*".

Largely due to the age class substitution, the selected allocation is predicted to provide considerably more volume than modelled. The volume for the two years should be about 2.6M m3 conifer and 1.0M m3 hardwood but planned harvest is 3.7M m3 conifer and 1.3M m3 hardwood - an extra 1.1M m3 of conifer (+30%) and 300k m3 of hardwood (+24%) over the two years. Reasoning given is limitations to operating areas to avoid caribou habitat, to utilize accessible areas and to avoid contentious areas. Also, "*With the allocations being kept out of the lower productivity areas of caribou habitat in the more northerly sections of the unit, this meant that allocations were forced to the more productive areas of the forest*".

Discussion:
As described in the 2010-12 CP this imbalance could be re-aligned over the remaining eight years of the planned 2010-20 FMP but according to interviews with MNR staff and documentation, the plan for the Abitibi River Forest has changed. Instead of completing a plan for the term 2010-20, which was to include the planned harvest in the 2010-12 CP as the first two years of the ten year allocation, the new plan is to produce a 2012-22 FMP. This will not allow re-alignment of the allocation and may provide for additional age class substitution into younger stands. Further, there will be no practical way of determining the effect of the imbalance during the two-year stand-alone CP.

Conclusion:
Due to the severe downturn in the forestry sector it is unlikely that the full planned harvest will be realized, so there are no real concerns regarding sustainability and no need to amend the 2010-12 CP. However, there is concern regarding public disclosure and accountability as well as further age class substitution should the new FMP be fully detached from the 2010-12 CP.

Recommendation 6: ARFMI must consider the harvest profile selected in the 2010-12 CP when developing the profile for the next FMP so that further substitution into younger age classes does not occur.

Independent Forest Audit – Record of Finding

Recommendation 7

Principle: 3 Forest Management Planning

Criterion: 3.5.5 FMP harvest and natural depletions

Procedure: 3.5.5.1 Assess planned implementation of the management strategy by reviewing

- the projected, forecast and planned harvest (including fuelwood) and natural depletions in relation to the applicable FMP planning requirements including residual stand structure and comparison to the management strategy

Background Information and Summary of Evidence:
The 2010-12 CP contains an excellent section describing utilization direction to be used during operations. The direction was adapted from the Northeast Region Operations Guide for Marketability Issues (Apr. 2008). The Operations Guide was developed over several years by an MNR Regional group aided by several scientific advisors and industry representatives as a result of ongoing and forecast utilization issues in the Region. The Guide was developed mainly to provide direction regarding natural renewal of hardwoods following partial harvest but also provides direction for renewal to conifer.

The Northeast Guide allows for the retention of up to 30% of standing trees in cutovers (equated to approximately 70 trees per hectare). This value was selected based on provision of adequate openings for natural renewal of hardwood tree species. The Guide also allows for felling and leaving up to 100 trees per hectare reasonably distributed on site and bringing an unidentified number of additional unmarketable trees to roadside to reduce renewal interference and provide possible future fibre for emerging markets. When renewing conifer, no more than 25-50 residual trees are to be left standing per hectare after harvest. Specific renewal stocking limits are also provided:

- Site occupancy cannot be reduced to less than 90%
- Density of well-spaced, free-growing trees cannot be reduced below 1,000 conifer stems per hectare or 1,500 hardwood stems per hectare (further identified as effective density of >7,000 randomly distributed aspen stems per hectare).

The Guide also includes a requirement to develop a prescription/action plan to ensure silvicultural success and adherence to accepted practices in stands harvested using the Guide. Appendices also include deferral strategies as well as a sample operational decision key.

Discussion:
The Northeast Guide is considered a thoughtful resource for use by forest management planners but there are issues. First, Ontario's FRI Photo Interpretation Specifications and the Forest Information Manual (2009) Technical Specifications for FRI note that stands with low stocking (traditionally deemed 'barren and scattered') have a crown closure of less than 25%. Therefore a 30% residual canopy following harvest will still form a stand in the next FRI regardless of silviculture performed and the stand will be classified as a low-stocked, high-graded stand. Second, there is no formal requirement to complete pre-harvest ground verification of forested conditions (one tactical consideration in the Guide is to "*consider field verification*"). The current inventory is often not precise enough to determine the required volume split, ground data or additional information is needed. In addition, the allowance for bringing unmarketable trees to roadside should be clarified. Loss of productive area along roadways to unmarketable trees should be minimized.

Conclusion:
The Northeast Guide residual canopy allowance should be aligned with FIM and Ontario's FRI Photo Interpretation Specifications to ensure consistency. Regarding the need for ground data or additional information – the utilization standards have fairly specific criteria that may not be met with the current inventory, which is based on interpretation of 1:20,000 scale black and white imagery. The auditors believe that ground surveying and/or utilization of the newer digital imagery for the Province would provide the additional information required to make informed management decisions for selected stands/blocks. Waste wood fibre management has been a concern of this audit and previous audits for this Forest. To ensure minimization of loss of productive land through bringing unmarketable trees to roadside, the Northeast Guide should clarify the expectations of this practice (e.g. only done within economic radius of end use facility, material piled and burned if not used within two years, etc.).

The following recommendation is made to strengthen the Guide in these respects.

Recommendation 7: MNR Region must update the *Northeast Region Operations Guide for Marketability Issues* document as follows:

- reduce the allowance for residual standing trees to no more than 25% canopy closure to better align the Guide with inventory standards
- incorporate a requirement to provide information, in addition to the current FRI description, to confirm actual stand conditions prior to finalizing operational plans
- clarify the allowance for bringing unmarketable trees to roadside in order to minimize the loss of productive area along roadways

Independent Forest Audit – Record of Finding

Recommendation 8

Principle: 3 Forest Management Planning

Criterion: 3.5.5 FMP harvest and natural depletions

Procedure: 3.5.5.1 Assess planned implementation of the management strategy by reviewing

- the projected, forecast and planned harvest (including fuelwood) and natural depletions in relation to the applicable FMP planning requirements including residual stand structure and comparison to the management strategy

Background Information and Summary of Evidence:
The Northeast Region Operations Guide for Marketability Issues was modified for use in the 2010-12 CP. In particular, allowance was provided to leave up to 70 residual standing trees on all sites. The 2010-12 CP pg. 180 states: "***Artificial Regeneration*** *- The following conditions apply to intolerant hardwood forest types where artificial regeneration for the establishment of conifer is proposed:*

- ***Trees Left Standing in the Cutover:*** *After the final harvest, no more than 70 trees per hectare are to be left standing as residual or wildlife trees or the site should be chemical site prepared.*"

Discussion:
The Guide direction is to leave no more than 25-50 residual standing trees when conifer is planned so that proper silviculture treatment may occur.

Conclusion:
Allowing up to 70 trees is a considerable departure from the Guide direction and no rationale was provided for this in the FMP. Considering the Guide is the local resource used to aid in keeping utilization standards compliant with the Scaling Manual, the Guide direction should have been closely adhered to.

Recommendation 8: ARFMI must amend the utilization standards in the 2010-12 CP to be consistent with the Northeast Region Operations Guide for Marketability Issues document or provide compelling rationale for the significant deviation from that direction document. The 2012-22 FMP utilization standards should also conform to the Guide direction or provide rationale for departure.

Independent Forest Audit – Record of Finding

Recommendation 9

Principle: 3 Forest Management Planning

Criterion: 3.5.12 Determination of Sustainability

Procedure: Assess whether the FMP provides for the sustainability of the Crown forest on the management unit based on the collective achievement of the objectives, comparison of proposed operations to the LTMD and the associated rationale for any management objectives that are not achieving the desired levels.

Background Information and Summary of Evidence:
Section 3.7.7 of the analysis package for the 2010-12 CP includes specifics regarding planned conversion of harvested area to non-forest area based on an analysis by Tembec. The associated strategy links slash management to renewal intensity.

The slash analysis used for developing the corresponding 2010-12 CP model input included mapping of slash cover and calculating land lost by treatment type. No conversion was modelled after 30 years as all roads were assumed to be in place and slash disposal methods (e.g. biomass utilization) were expected to reduce slash losses to 0%.

Discussion:
Considering minimal on-the-ground improvement has occurred in slash management over the past 30 years and much of the Forest is very remote, the audit team believes the model assumption of no slash losses after 30 years is overly optimistic.

Conclusion:
Modelling for forest management plans needs to reflect on-the-ground results as closely as possible. In the absence of firm Provincial policy and considering the remoteness of much of the Forest, modelling for zero loss of productive land to slash after 30 years is not realistic. This should be remedied in the next FMP.

Recommendation 9: The Abitibi River Forest planning team must consider on-the-ground results, current Provincial direction and the remote nature of a large portion of the Forest when modelling for productive land loss due to waste wood fibre in the 2012-22 FMP.

Independent Forest Audit – Record of Finding

Recommendation 10

Principle: 3 Forest Management Planning

Criterion: 3.5.12 Determination of Sustainability

Procedure: Assess whether the FMP provides for the sustainability of the Crown forest on the management unit based on the collective achievement of the objectives, comparison of proposed operations to the LTMD and the associated rationale for any management objectives that are not achieving the desired levels.

Background Information and Summary of Evidence:
Section 3.7.7 of the analysis package for the 2010-12 CP includes specifics regarding planned conversion of harvested area to non-forest area based on an analysis by Tembec. The associated strategy links slash management to renewal intensity.

Using the CP allocated harvest area and the plan's estimates of slash coverage by silvicultural intensity, the audit team calculated that about 470 ha of productive land would be lost annually under slash (4,700 ha of productive Crown land lost or severely delayed for regeneration over the ten year term of an FMP). To the audit team this represents a significant potential loss of productive forest land. However, the issue is not confined to the Abitibi River Forest.

Discussion:
Accumulating waste fibre along roadways following harvesting operations is directly associated with mechanized full tree to road-side logging operations. With this process most unmerchantable material (i.e. slash) is laid down in long corridors next to the roadbed, often on both sides. Depending on tree size, marketability factors, etc. a considerable amount of waste fibre can accumulate along roadbeds. Accumulated waste wood fibre, particularly from conifer trees, is known to break down very slowly and create a physical impediment to new tree growth and chemically alter soil so that few plant species can grow under and around the slash.

To illustrate the duration and extent of the issue Provincially, the audit team conducted an analysis of IFA recommendations related to slash management. The analysis, covering the 1996-2008 period, found that recommendations were made in every year (average 5.5/year) and that the vast majority of recommendations (69) were directed at the Management Unit/District level while only three were directed at the Provincial (e.g. policy) level. Thirty seven of the recommendations were made in the Northeast Region, 33 in the Northwest Region and two in the Southern Region. While action plans have been developed to address IFA recommendations these have not always translated into reduced slash on the ground.

It is the audit team's opinion that the root of this ongoing problem of ineffective slash management is the lack of a clear Government policy requiring waste fibre management on Crown lands in Ontario. Other jurisdictions such as Manitoba have mandated that all waste fibre be left within the harvest area away from roadside. The most recent Provincial level recommendation related to slash occurred in the 2002-07 IFA for the Romeo Malette Forest. A component of the action plan to address the recommendation looked to the Stand and Site Guide, under development at the time, to provide direction.

In the audit team's view, the Stand and Site Guide, now released, does not adequately address the loss of productive forest land to slash because the guideline definition allows for unrestricted local variation of application, and the actual guideline, which uses the ambiguous wording (see underlined) '*Unutilized woody material ... will be piled, redistributed, or otherwise treated to increase area available for regeneration*', allows too much flexibility in managing slash and thus allowance to continue with current practices which are not dealing with the issue of significant, long term losses of productive forest area. As an example, leaving slash unpiled at roadside in anticipation of eventual natural recycling could be construed as an acceptable 'treatment to increase' available area.

To verify the predicted inadequacy of the Stand and Site Guide in dealing with slash, the auditor spoke with one of Tembec's forest management planning staff currently working on completing a new FMP, which must heed the Stand and Site Guidelines (SSG), for another management unit in Northeastern Ontario. This representative noted that Tembec's standard slash management policy has been included in the draft FMP and is expected to meet the SSG requirements. It is the auditor's opinion that Tembec's slash management policy allows for leaving large areas of slash untreated and has been ineffective in minimizing productive land loss and therefore does not meet the intent of the SSG direction.

Conclusion:
When preliminary audit findings were discussed during the closing meeting held at the end of the field segment of the audit, the sentiment from company representatives was that current slash management practices will not considerably change until clear Provincial direction to do so is provided; the auditors concur. The history of poor slash management in Ontario continues, as illustrated by current practices on the Abitibi River Forest. Despite repeat findings and recommendations in the Independent Forest Audits, the Province has failed to develop effective policies and guidelines that lead to appropriate practices on the ground to address the loss of productive forest land to slash. The auditors forecast that direction in the Stand and Site Guide will not substantially change this.

Recommendation 10: Corporate MNR must develop a policy to address waste fibre management, consistent with the intent of minimizing losses of productive forest land, and provide associated direction to MNR regions, districts and the forest industry, including standards for acceptable allowances for conversion of productive forest land to non-productive forest land. MNR should also periodically report to the public the cumulative loss of area and growing stock potential due to forest land occupied by waste fibre.

Independent Forest Audit – Record of Finding **Recommendation 11**
Principle: 3 Forest Management Planning **Criterion:** 3.5.12 Determination of Sustainability **Procedure:** Assess whether the FMP provides for the sustainability of the Crown forest on the management unit based on the collective achievement of the objectives, comparison of proposed operations to the LTMD and the associated rationale for any management objectives that are not achieving the desired levels.
Background Information and Summary of Evidence: There is no direction in the 2010-12 CP regarding management of chipping debris.
Discussion: According to company representatives there is a plan to increase in-bush chipping on the Abitibi River Forest in the near future.
Conclusion: While in-bush chipping can reduce slash accumulation, chipper debris can become a localized issue and an impediment to objective achievement. The auditors have found that excessive chipper debris has been an issue on many other management units in Ontario and that lack of clear direction on how to deal with the material is often a root cause.
Recommendation 11: ARFMI must include direction regarding management of chipping debris in the next FMP.

Independent Forest Audit – Record of Finding

Recommendation 12

Principle: 3 Forest Management Planning

Criterion: 3.5.7 FMP renewal, tending, protection and renewal support

Procedure(s): 1. Assess planned implementation of the management strategy by assessing whether the:

- renewal, tending and protection operations have been planned as required of the applicable FMPM, including any proposed prescribed burns, aerial herbicide tending, eligible pest management areas, aerial application of insecticides
- forecasts are consistent with the proposed management strategy (e.g. the levels required to achieve management objectives) and whether any differences are material

Background Information and Summary of Evidence:
The proposed management strategy selected for the 2010-12 CP forecast a planned renewal intensity ratio of 61% Extensive, 35.5% Basic and 3.5% Intensive. Table FMP-21 shows a renewal program of 77% Extensive, 16% Basic and 7% Intensive. This is a significant deviation in planned renewal intensities vs. the management strategy (i.e. much more Extensive and a little more Intensive and much less Basic). Renewal operations for the 10 year forecast (2010-20) in FMP-21 were determined to be consistent with the LTMD, however they have little relevance since they will not be carried forward in the 2012-22 FMP.

Renewal, tending and protection operations forecast for the 2010-12 CP were based on areas harvested in 2008-09 and areas planned in the AWS for harvesting 2009-10. Renewal, tending and protection operations forecast for the 2010-12 CP were not based on SFMM modelling outputs, instead they were determined by each individual SFL holder and MNR staff (CMRMU) based on their own knowledge of the harvest areas. It was determined that the 2010-12 CP provided inadequate analysis and supporting information to justify the planned deviation from the LTMD during that two year period.

Block listings of the planned renewal activities on the SRFF, CMRMU & IFF were reviewed and it was found that there is insufficient information and analysis to substantiate the renewal activities planned in FMP-21 (2 year contingency period), particularly when compared to the renewal modelled.

The 2008-10 CP for the CMRMU also had a planned renewal profile which deviated significantly from the LTMD by relying more heavily on extensive operations (95% extensive (FMP-21) vs 66% extensive (LTMD)). According to company staff this was due to uncertainties in achieving planned harvest and having to order trees up to one and one-half years in advance of planting. Rationale in the text included noting that renewal discrepancies will be made up in the next plan - pg 191 ln 22-30 "*Because of the current economic uncertainty, the silvicultural program over the two-year period will be reduced....It is expected that a larger than normal regeneration program could be implemented the first year of the 2010-2020 FMP*"; this turned out to be the 2010-12 CP for the amalgamated forests. As noted, the 2010-12 CP also deviated so this was not reconciled as planned.

Interviews and documentation indicate that a 2010-20 FMP (for which the 2010-12 CP was to be the first two years) is no longer being considered; instead a 2012-22 FMP is to be implemented.

Section 4.8.3 in the CP (comparison of proposed operations to the LTMD) provides an erroneous analysis of the proposed renewal operations (2010-2012) vs. the LTMD stating that "*more planting over natural regeneration is planned*". However, planned planting area shown in Table 38 does not correspond with planned planting in Table FMP-21 (21,087 ha vs. 4,252 ha). The Table 38 planned planting value was determined to be an error as was the statement that more planting is planned over natural regeneration. The planned amount of planting is 4,252 ha (FMP-21), ~10,000 ha short of the planting levels required to meet the proposed management strategy.

Part B, Section 4.8 of the 2004 FMPM states, in part, "*If proposed types and levels of operations deviate from the projections in the LTMD, a discussion of the effects on objective achievement and sustainability will be provided.*"

Because the large planting discrepancy was not recognized during plan preparation, no discussion or analysis was provided in the CP which substantiates the significant deviation from the modelled renewal program

Discussion:
It is important that planned renewal activities are consistent with the management direction in the FMP or that sufficient analysis and rationalization is provided in the plan to substantiate significant deviations. If a 2010-20 FMP was developed and planned renewal was consistent with the 10 year forecast in FMP-21 of the 2010-12 CP there would be no issue. However, if a new 2012-22 FMP is developed, there will be little linkage to the prior contingency plans and reconciliation of deviations between planned and modelled renewal may not occur.

The requested analysis, rationalisation and reconciliation of the planned renewal operations during the 2010-12 period will be tabled in the 2012-22 FMP since the current CP will expire in 2012 and any requested amendments to the plan would likely not receive approval until after plan expiry.

Conclusion:
The deviation between modelled and planned renewal in the 2008-10 CP for the CMRMU and the 2010-12 CP for the amalgamated forests, which select more extensive treatments than modelled, does not meet FMPM requirements - 2004 FMPM (A-53 ln 4-6) states "*The levels of renewal and tending operations will be consistent with the projected levels of the proposed management strategy and the results of the renewal and tending analysis".* Similar direction is included in the 2009 FMPM so a recommendation is made.

Recommendation 12: ARFMI must consider the renewal profile selected in the 2010-12 CP when developing the profile for the next FMP and include sufficient analysis in the 2012-22 FMP to justify the significant deviation from the planned LTMD during the two year contingency period.

Independent Forest Audit – Record of Finding

Recommendation 13

Principle: 3 Forest Management Planning

Criterion: 3.5.10.2 FMP monitoring programs

Procedure: Assess whether the monitoring programs to be implemented, including forecast level of assessment, are sufficient to assess the compliance and program effectiveness on the management unit.

Background Information and Summary of Evidence:
Table FMP-1 of the 2010-12 CP indicates 172,583 ha of Managed Crown Production Forest are below regeneration standards (about 9% of the Production Forest). Assuming harvest and renewal rates were relatively equal over the past several years this equates to about 17,000 ha that require regeneration surveying annually.

Table FMP-25 indicates 22,189 ha is to be surveyed over the 2010-12 period (about 11,000 ha yearly). This is approximately 6,000 ha short of the expected annual level of survey needed to at least maintain the proportion of area deemed below regeneration standards.

Discussion:
The forecast deficit of renewal assessment will lead to an increase of area classified as below regeneration standards. Additionally, underachievement in areas surveyed leads to delays in assessing silviculture success.

Conclusion:
Timely assessment of renewing land is needed to ensure the FRI is kept current and to determine if renewal efforts on the landbase are consistent with the LTMD. Increasing area classified as below regeneration standards contributes to uncertainties in the FRI and FMP modelling.

The 2004 FMPM (B-99 ln 8-10) states "*The amount of area to be assessed for success should be consistent with the level of regeneration success required to meet plan objectives and the management strategy as well as levels of past disturbance (i.e., harvest and natural).*" This direction needs to be followed.

Recommendation 13: ARFMI must review the planned renewal assessment program in the 2010-12 CP to ensure that the next FMP covers the existing shortfall.

Independent Forest Audit – Record of Finding

Recommendation 14

Principle: 4. Plan Assessment and Implementation

Criterion: 4.3 Harvest

Procedure: Review and assess in the field the implementation of approved harvest operations. Include the following:

- assess whether: the harvest and logging methods implemented were consistent with the FOP; the FOP was consistent with the SGRs; the FOP was certified by an R.P.F. or other qualified individual, and actual operations were appropriate and effective for the actual site conditions encountered

Background Information and Summary of Evidence:
There has been a long history of slash management issues in the area. The 1995-2000 IFA for the Cochrane Forest noted that roadside slash occupied a significant portion of the available ground and provided a recommendation that MNR develop and implement a strategy to reduce the area occupied by slash. The 1995-2000 IFA of the Moose River Forest had similar findings and recommended that Tembec and Norbord implement a program directed at the management of roadside slash.

The action plan for the 1995-2000 Cochrane Forest IFA slash recommendation contained eight items ranging from hiring a contract silviculture forester to creating and implementing a slash disposal plan. All of the items were noted as being completed in the Action Plan Final Status Report; the 2000-05 Cochrane/Moose River IFA audit team concurred.

The action plan for the 1995-2000 Moose River Forest IFA slash recommendation contained four items all of which were considered completed in the Action Plan Final Status Report. The first action item – "*Initiate efforts to reduce productive forest area lost to roadside slash*" – was deemed completed through conducting slash pile burning programs from 2001-04 and documenting the results in Annual Reports. The auditors for the 2000-05 Cochrane/Moose River IFA agreed that the prior recommendation had been met.

With the severe downturn of the forest sector over the past several years slash management has again declined on the CMRMU.

Discussion:
While there are many options for reducing slash at roadside, piling and burning had been the preferred choice to regain maximum productive area. However, negative public comments regarding smoke, difficulty getting MNR approval to burn, saturated conditions during planned ignition periods and high costs relative to net area recovered became impediments to slash piling and burning. Also, the predominance of winter harvest and need to haul wood before spring thaw meant that slash management was not a company priority. In the absence of clear Provincial direction, less intensive options such as piling with no burning or leaving slash un-piled gained favour.

The 2003-08 FMP included limited information regarding the planned slash management program – "*redistribution of slash was to be explored*" (this was not done), otherwise "*priority was to be given to higher productivity sites and not all sites were to be piled or burned*". The 2008-10 CP clarified slash management direction and linked it to silviculture intensity as per Tembec's Regional Slash Management Strategy, which was included in the supplementary documentation – "*slash piling only intensive sites or basic conifer sites otherwise slash left unpiled, no slash burning is planned*".

The 2003-08 FMP and 2008-10 CP also included strategies for reducing slash on the Forest – implementation of a cut-to-length system to leave slash distributed across the site and, distribute slash on roadbeds when it corresponds to the road abandonment plan. Neither of these strategies was employed during the audit term.

The direction in these documents is quite similar and non-committal regarding a majority of planned harvest sites i.e. the lower productivity lowland spruce sites that dominate the area. Through implementation of this direction there was obvious degradation of the slash management program when compared to the prior audit term. Some of the blocks operated in the prior term and audited for tending treatments or renewal status in this audit had had slash piled and burned and the recovered areas had been subsequently fill-planted. Management in areas operated during this audit term consisted of piling slash or leaving it un-piled.

When questioned regarding the reasoning for allowing slash to again become a problem on the Forest, MNR noted that they had responsibility for the Cochrane sub-unit and had provided direction to operators to pile slash throughout the term. On the sub-unit piling occurred but MNR was hesitant to burn due to proximity to town and rural properties and the potential for negative public response. There was also concern noted regarding the requirement to provide a low complexity fire plan in AWSs. However, these plans have been largely simplified in the past few years and are essentially a template to be filled out.

Tembec was responsible for slash management on the Moose River sub-unit and followed most of the direction in the plans, which was non-committal for extensive areas. So, other than not implementing some of the strategies listed in the plans, slash management completed followed the FMP directions. What is not clear is why the 2003-08 FMP and 2008-10 CP contained slash management plans that could not meet the action plans devised for the 1995-2000 IFA slash recommendations for the Cochrane and Moose River Management Units.

Continual improvement is cited as an over-arching objective or goal by the forest sector. The compliance plan for the 2008-10 CP noted that Tembec's ISO 14001 and FSC certifications and Norbord's SFI certification encourages striving for higher standards and results on a continuous basis, so slash management should have improved through time rather than regressed. In the absence of Provincial direction (discussed with a recommendation in the Forest Management Planning section of the audit), forest managers have opted for cost cutting measures that do not allow for adequate management of waste fibre.

Conclusion:
Although FMP direction was generally followed during the audit term, the slash management program delivered was not considered effective by the audit team and did not fulfill prior IFA recommendations and associated action plans related to reducing slash on the Forest. Further, the slash management plan in the 2010-12 CP is deemed inadequate to minimize loss of productive Crown land. Looking forward, the current slash management plan will not meet the intent of the related guidelines in the Stand and Site Guide.

Recommendation 14: ARFMI must ensure the slash management plan in the 2012-22 FMP can meet plan objectives and guidelines focused on minimizing loss of productive land.

Independent Forest Audit – Record of Finding

Recommendation 15

Principle: 4 Plan Assessment and Implementation

Criterion: 4.1 Plan Assessment – To review and assess through field examination whether information used in preparation of the FMP was appropriate and assess the implementation of the management strategy.

Procedure: 1. In the conduct of the field audit examine areas of the FMP that can be assessed in the field and assess whether the FMP was appropriate in the circumstances. Include consideration of:

- modelling assumptions
- SGRs e.g. overall relevance to management unit as seen in the field (all being implemented as per management alternative/strategy or portion is planned reflective of field application).
- Proposed harvest, renewal and tending areas for consistency with eligibility and selection criteria.

Background Information and Summary of Evidence:
Careful Logging Around Advanced Growth (CLAAG) or Harvesting with Regeneration Protection (HARP), depending on the pre-harvest forest condition is a harvesting system used on lowland sites to protect advanced growth black spruce. CLAAG and HARP are well suited to most of the lowland sites that dominate the area. Effective CLAAG and HARP prescriptions were viewed during the field audit and it was evident that operators are well trained and very proficient at implementing careful logging techniques on lowland black spruce sites, which are abundant on the CMRMU. Areas harvested under the CLAAG and HARP systems were found to have sufficient advanced regeneration spruce in the leave strips while site impact within harvest corridors was minimized, thus providing the requisite microsite for natural seeding or potential fill planting.

However, operators have become over-reliant on this system and careful logging is implemented on virtually all sites. Careful logging techniques are not well suited to upland sites since the advanced regeneration in leave strips often consists of undesirable species. Careful logging viewed on most upland sites was deemed to be ineffective. Little advanced growth was present to protect in some areas and shrubs now dominate. In other areas regeneration mainly consists of balsam fir, balsam poplar and birch – less desirable species than the spruce and aspen harvested. Considerable active renewal through chemical and/or mechanical site preparation, planting and tending will be needed to meet standards on some of these sites. Other sites will naturally renew to less desirable species.

Some transition from SBC to LC1 is planned for in FMP modelling. Table FMP-16 in the 2003-08 CMRMU FMP indicates a 7.5% shift from SBC to LC1 for the five-year allocation. However, as evidenced by annual reporting, the TAR and audit findings, SBC sites are becoming LC1 at much higher rates than predicted due to increased larch content. As discussed, this is largely due to retaining mature larch trees on cutover areas, which are effectively acting as seed trees.

Increased presence of other less desirable tree species such as balsam fir, balsam poplar, etc. is common with the implementation of CLAAG harvesting on upland stands. Resulting forest unit transitions are being tracked for some upland forest units, which raises concerns for the audit team. For example, examination of FTG results from 2003-09 shows that SP1 (Spruce Pine forest unit) treated to remain SP1 was successful only 47% of the time. The TAR has a rate of 59% for this transition. On the other hand, Table FMP-16 for the 2003-08 FMP only forecasts a 2.4% decrease in SP1 (mainly to conversion to roads). Based on documentation and field visits SP1 sites are shifting to other forest units such as SF1 (due to increased balsam fir content) or mixedwood forest units through increased presence of hardwoods.

Upland careful logging harvest further hampers active renewal efforts by reducing available planting areas and presenting tending challenges; this was noted during the audit. On these sites planting densities were constrained due to lack of planting spots, a heavy shrub layer and presence of less desirable tree species. Average planting density throughout the term was 1,197 trees/ha compared to the targeted density of 1,800 trees/ha.

The *Silvicultural Guide to Managing for Black Spruce, Jack Pine and Aspen on Boreal Forest Ecosites in Ontario* (Silvicultural Guide) states that CLAAG can increase the proportion of balsam fir in the future stand and that the use of advanced growth may be used to enhance other regeneration treatments. The Silvicultural Guide also provides clear direction on the types of sites which natural advanced growth is recommended, conditionally recommended and not recommended (NR). Not recommended activities are described as being not ecologically appropriate or not supported by field experience and field knowledge. The use of not recommended activities requires the implementation of exceptions monitoring.

Discussion:
The 2010-12 CP SGRs no longer permit CLAAG or HARP on upland sites; however there is now a compliment of upland sites treated in this manner that will regenerate to poor quality stands unless remedial treatments are undertaken. Some of these sites will be too expensive to treat, however the effort should be made to identify and treat those that are practical to do so.

Also, should it be determined during the review of these sites that NR activities have been implemented, such as the use of natural advanced growth as a regeneration method on upland sites, that exceptions monitoring be implemented as per the requirements of the FMPM and the Silvicultural Guide.

Conclusion:
The implementation of CLAAG harvesting patterns on upland sites is contributing to the retention of less desirable species, particularly larch and balsam fir, and is leading to a degraded stand condition in terms of species composition and stocking.

Recommendation 15: ARFMI must:

a) conduct an immediate review of all upland sites harvested under the CLAAG system since 2003 and implement remedial silvicultural treatments, where practical, on sites found not likely to become a silvicultural success.
b) implement exceptions monitoring on all upland CLAAG sites for which the use of natural advance growth (without planting) as a regeneration method is deemed as not recommended under the Silvicultural Guide.

Independent Forest Audit – Record of Finding

Recommendation 16

Principle: 4: Plan Assessment and Implementation

Criterion: 4.1 Plan Assessment – To review and assess through field examination whether information used in preparation of the FMP was appropriate and assess the implementation of the management strategy.

Procedure: 1. In the conduct of the field audit examine areas of the FMP that can be assessed in the field and assess whether the FMP was appropriate in the circumstances. Include consideration of:

- modelling assumptions
- SGRs e.g. overall relevance to management unit as seen in the field (all being implemented as per management alternative/strategy or portion is planned reflective of field application).
- proposed harvest, renewal and tending areas for consistency with eligibility and selection criteria.

Background Information and Summary of Evidence:
It was noted that, due to lack of markets, larch trees were often left standing on site following harvest as part of the NDPEG requirements. Larch is a prolific seeder and dense larch regeneration was found on many of the lowland stands audited. It was evident that larch is becoming more prevalent in some stands; this increase from one generation to the next is sometimes called 'creep'.

Furthermore, upland CLAAG harvesting patterns were broadly implemented on most harvested sites. Although the majority of areas harvested were well suited to this type of harvesting (lowland black spruce peatland) implementation on upland sites resulted in a significant retention of undesirable species.

Larch creep has some history on the Forest. Older stands viewed for FTG often had higher larch components than the original stand composition; this is being captured in monitoring and reporting for the Forest. As indicated in the TAR for the CMRMU; "*Although the total area regenerated by Forest Unit is acceptable, the future forest units being created by the treatments do not appear to be meeting the projected levels*". Table AR-13a in the TAR indicates that SBC (black spruce CLAAG forest unit) treated to bring back SBC was only successful 37% of the time. FTG results for 2003-09 indicate slightly higher success for this transition ~55%. Conversely, SBC treated to create LC1 (other lowland conifer forest unit i.e. larch and/or cedar dominated) was 100% successful.

Older stands viewed for FTG often had higher larch components than the original stand composition; this is being captured in monitoring and reporting for the Forest. As indicated in the TAR for the CMRMU; "*Although the total area regenerated by Forest Unit is acceptable, the future forest units being created by the treatments do not appear to be meeting the projected levels*". Table AR-13a in the TAR indicates that SBC (black spruce CLAAG forest unit) treated to bring back SBC was only successful 37% of the time. FTG results for 2003-09 indicate slightly higher success for this transition ~55%. Conversely, SBC treated to create LC1 (other lowland conifer forest unit i.e. larch and/or cedar dominated) was 100% successful.

Some transition from SBC to LC1 is planned for in FMP modelling. Table FMP-16 in the 2003-08 CMRMU FMP indicates a 7.5% shift from SBC to LC1 for the five-year allocation. However, as evidenced by annual reporting, the TAR and audit findings, SBC sites are becoming LC1 at much higher rates than predicted due to increased larch content. As discussed, this is largely due to retaining mature larch trees on cutover areas, which are effectively acting as seed trees.

Increased presence of other less desirable tree species such as balsam fir, balsam poplar, etc. is common with the implementation of CLAAG harvesting on upland stands. Resulting forest unit transitions are being tracked for some upland forest units, which raises concerns for the audit team. For example, examination of FTG results from 2003-09 shows that SP1 (Spruce Pine forest unit) treated to remain SP1 was successful only 47% of the time. The TAR has a rate of 59% for this transition. On the other hand, table FMP-16 for the 2003-08 FMP only forecasts a 2.4% decrease in SP1 (mainly to conversion to roads). Based on documentation and field visits SP1 sites are shifting to other forest units such as SF1 (due to increased balsam fir content) or mixed wood forest units through increased presence of hardwoods.

Discussion:
The main issue is that transition of significant amounts of area from forest units dominated by preferred tree species to those with less preferred tree species is a threat to forest sustainability. There has historically been very little market for larch, balsam fir or balsam poplar and this may not change.

It is suggested that the following modifications to operational practices be implemented:

- Best management practices implemented during harvesting activities to minimize the retention of larch trees as 'snags'. Trees should be felled or stubbed and left on site to prevent seeding. This practice has been implemented in the Red Lake District to minimize birch seeding in the Caribou management zone.
- Proper assessment of stand site suitability and black spruce advanced growth potential is needed prior to harvest implementation. This will likely require the physical delineation of CLAAG harvest areas vs. areas requiring conventional clear cut harvesting. The implementation of GPS systems during harvest would also allow operators to easily differentiate appropriate harvest prescriptions.
- Site preparation using sheer blades can be used as a remediation tool on sites with significant advanced growth of undesirable species (particularly Bf).

Conclusion:
Forest unit transition trends are moving beyond the modelled limits of the FMP. It was determined that operational practices are a primary contributor to the retention and proliferation of less desirable tree species on the CMRMU. Modifications to current operational practices are needed to ensure that a sustainable volume of marketable tree species is maintained on the Forest.

Recommendation 16: ARFMI must address the increase in presence on the Forest of less desirable tree species such as larch and balsam fir.

Independent Forest Audit – Record of Finding

Recommendation 17

Principle: 6 Monitoring

Criterion: 6.3.2 Silviculture Standards and Assessment Program

Procedure: 2 Assess whether the SFL/management unit assessment program is sufficient and is being used to provide the required silviculture effectiveness monitoring information including whether it:

- assesses overall effectiveness of treatments, including those that are exceptions to silvicultural guides i.e. documented program, survey methodology such as survival, stocking, free-to-grow surveys, records, use and evaluation of results e.g. appropriateness of treatment for actual site conditions
- determines the need for and the type of remedial action required if an area is not successfully regenerated (e.g. in fill plant, tending)
- assesses reasons where eligible areas are not determined to be successfully regenerated and addresses these situations
- is appropriately used to update the FRI
- assesses progress towards achieving the management strategy

Background Information and Summary of Evidence:
It was determined that Tembec has comprehensive silviculture monitoring procedures in place but there were issues implementing the program and some components lack rigor. The program includes pre-harvest surveys and post-harvest/CLAAG surveys, informal tending surveys and FTG assessment.

There was a significant shortfall during the audit term in terms of the organization and execution of the SEM program; there was an underachievement in monitoring, informal monitoring completed with no records, and inconsistent data entry. During interviews and in SEM documents MNR expressed concern, particularly later in the audit period, over reduced company staffing available to effectively deliver and monitor the silviculture program. MNR's concern was validated during the audit by Tembec staff who stated that shortfalls in the silviculture monitoring program were due to the significant sector downturn that led to budgetary restraint and loss of field staff during the audit period.

At the time of the field audit, none of the staff who directly managed the silviculture program were still employed by the company so information regarding the monitoring program implemented was limited. For example, documentation or discussion of pre-harvest or post-harvest/CLAAG assessments completed during the audit term was not available. The silviculture records that were available were found to be incomplete and poorly organized. Tembec used informal aerial surveys to determine the requirement for tending but minimal documentation of these surveys was available for review.

There was also a significant underachievement in the amount of area declared naturally regenerated during the audit period. When pro-rated based on actual harvest levels during the audit term, about 16% was achieved. The underachievement is confirmed in the 2010 TAR for the CMRMU, which notes that "*It is apparent that reporting on natural regeneration was postponed into the next period*".

Active renewal was more commonly assessed so that, in total, 5,222 ha was assessed as regenerated versus 7,297 ha harvested (71%).

Discussion:
The proper execution of a silviculture effectiveness monitoring program plays a critical role in identifying shortcomings or required remedial actions with implemented renewal, tending and protection activities. Competitive soils on many planted sites require timely monitoring for competition and application of release treatments where needed. Missed or delayed competition control treatments can lead to poor regeneration results. The TAR notes that delayed or uncompleted tending was a contributor to low silviculture success. Also, no documented post-spray survey assessments were completed during the term to confirm efficacy of treatment.

Of specific concern during this audit is the underachievement of area declared naturally regenerated. The underachievement of natural renewal assessment makes it difficult to assess consistency of the implemented renewal operations with those planned and to identify areas that may require remedial treatments.

Conclusion:

Implementation of the silviculture monitoring was inadequate during the audit term. A backlog of area requiring assessment exists which needs to be addressed and, going forward, areas planned for natural regeneration need to be declared within the required timeframe as stated in the FMPM.
Recommendation 17: ARFMI must implement an effective silviculture monitoring system, complete the assessment of naturally regenerating backlog areas, and report areas planned for natural regeneration within the timeframe specified in the FMPM.

Independent Forest Audit – Record of Finding

Best Practice 2

Principle: 6 Monitoring

Criterion: 6.3.2 Silviculture Standards and Assessment Program

Procedure: 2 Assess whether the SFL/management unit assessment program is sufficient and is being used to provide the required silviculture effectiveness monitoring information including whether it:

- assesses overall effectiveness of treatments, including those that are exceptions to silvicultural guides i.e. documented program, survey methodology such as survival, stocking, free-to-grow surveys, records, use and evaluation of results e.g. appropriateness of treatment for actual site conditions
- determines the need for and the type of remedial action required if an area is not successfully regenerated (e.g. in-fill plant, tending)
- assesses reasons where eligible areas are not determined to be successfully regenerated and addresses these situations
- is appropriately used to update the FRI
- assesses progress towards achieving the management strategy

Background Information and Summary of Evidence:
The Cochrane District MNR implemented a silvicultural effectiveness monitoring program in 2005 covering two SFLs (SRFF & IFF) and one Crown managed unit (CMRMU). The program was based on Provincial directives, which were used to develop core monitoring tasks and minimum sampling targets for the District. The primary focus of the program was the assessment of FTG submissions through both aerial surveys and intensive ground surveys using the Well Spaced Free Growing methodology. Discrepancies between company submissions and MNR audit results were thoroughly discussed and analyzed. MNR also analysed FTG results with regards to silviculture success and trends in forest unit transitions. In addition, MNR audited the effectiveness of specific silviculture activities such as tree planting, tending, slash piling/burning and aerial seeding.

The program was implemented in each year of the audit term starting with the 2005 field season. A report was completed the following year for each field season; thus four reports were reviewed for the audit (2010 field season report not available until 2011). SEM results were presented annually to the SFL holders and/or service providers to identify shortcomings in the silviculture program. When necessary, MNR and company staff jointly developed strategies and required action plans to address critical issues.

Discussion:
Silvicultural effectiveness monitoring is an integral part of a successful silviculture program. The Cochrane District MNR SEM program was successfully implemented during a period when most company monitoring programs were being suspended due to budgetary and staffing constraints. The Cochrane District MNR SEM program is providing valuable data and analysis concerning the success of implemented silvicultural activities. MNR staff is cooperatively working with company staff to meet information requirements.

Conclusion:
The Cochrane District MNR SEM program provides significant value with respect to monitoring, assessment and analysis of company FTG submissions and implemented silvicultural activities and identifying important silviculture trends. The maintenance of this program during challenging economic times and the cooperative working relationship with company staff set this program above the norm.

The audit team also determined that MNR completed outstanding work with regards to compliance monitoring (discussed in Monitoring section). This Best Practice was developed to recognize both of these areas of excellence.

Best Practice: The monitoring of silviculture effectiveness and compliance by the Ministry of Natural Resources during the audit term was deemed to be excellent.

Independent Forest Audit – Record of Finding

Recommendation 18

Principle: 6 Monitoring

Criterion: 6.5 Determine whether annual reports are prepared according to the FMPM and assess whether they accurately report implementation and assess progress in meeting objectives.

Procedure: 6.5.1 – 6.5.3; Review annual reports and compare against FMPM requirements and field observations.

Background Information and Summary of Evidence:
The Annual Reports met FMPM requirements. Table AR-14 (2004 FMPM) and AR-13 (2009 FMPM) reported low (less than 55%) silvicultural success contrary to field observations.

Discussion:
The Silvicultural Ground Rules (SGRs as per Table FMP-5) and the Annual Report Tables (AR-13 (2009) and AR-14 (2004)) assume that only one future forest unit is associated with a given SGR. This ignores the fact that forest units may succeed over time and that many treatments are expected to lead to a certain proportion of future forest units depending upon the current condition, the desired future forest condition and the level of inputs or intensity of treatments.

The projections made in the strategic model (SFMM) recognize the reality of multiple post-harvest and post-fire successional pathways. These forecasts are the first step in adaptive management, followed by implementation and monitoring. Variances in monitored outcomes are used to alter practices and improve future forecasts as part of a continual cycle of institutional learning. Adaptive management is a key forest policy element in Ontario.

Conclusion:
The FMPM reporting system does not recognize multiple successional pathways, leading to a breakdown in the adaptive management cycle at the monitoring phase. In addition, low silviculture success ratios as currently derived by the reporting procedures under the FMPM, may send the wrong signals to policy makers and the general public.

Recommendation 18: Corporate MNR must review the reporting procedures and consider modifying them to recognize multiple successional pathways to improve the adaptive management process.

Independent Forest Audit – Record of Finding

Recommendation 19

Principle: 8.2 Contractual Obligations – Crown Management Units

Criterion: 8.2.2 IFA Action Plan and Status Report

Procedure(s): 8.2.2.1; 8.2.2.2 Action Plan/Status Report meet requirements

Background Information and Summary of Evidence: The audit report for the previous IFA was received by the auditees in May 2006 which made the audit action plan due in July 2006. According to an MNR summary of activities related to the preparation of the Audit Action Plan and Status Report a Draft Action Plan (not viewed by auditor) was submitted by Cochrane District to Forest Management Branch and the Region on July 14, 2006. A revised Action Plan was subsequently submitted by Cochrane District on May 4, 2007 and final approval was given on June 13, 2007, approximately one year past due. The Action Plan met the content requirements of 2005 IFAPP. Based on the submission date of the Action Plan an Action Plan Status Report was required by July 13, 2009. A Year 1 Interim Status Report was submitted by Cochrane District on Nov 5, 2008 (the IFA had recommended MNR complete an Interim Status Report one year following approval of the Action Plan which would have been by June 2008). The Year 2 Status Report was submitted on September 7, 2010 whereas it should have been submitted no later than June 2009 based on IFAPP reporting timelines.

Conclusion: The auditee failed to meet the timelines set in the IFAPP for the submission of the audit action plan and status report and in the 2005 IFA report for the submission of the interim action plan status report.

Recommendation 19: The Cochrane District Manager must ensure that submission timelines for IFA Action Plans and Status Reports are met.

Appendix 2 – Management Objectives Tables

2003-08 Forest Management Plan and 2008-10 Contingency Plan – Cochrane Moose River Management Unit*

Objective		Assessment - Auditor Comments
Conservation of Biological Diversity Objectives		
Biological Diversity	Ensure current biological diversity is not significantly changed. Where necessary and practical, restore.	Partially Met. Targets to maintain mature and over-mature age classes are met. However, FTG data is showing some forest unit area shifting beyond modelled expectations, particularly in SBC & SP1 units. Implementation of upland CLAAG harvesting patterns is leading to advanced growth retention of undesirable species, in particular balsam fir and larch, and may create a future forest condition that is outside of long-term targets. See Recommendations 15, 16
Habitat	Maintain preferred/marginal habitat for featured regional species within bounds of natural variation.	Met – constraints applied during planning ensured habitat levels maintained for selected species
Caribou Habitat	Ensure harvesting practices do not reduce long term levels of caribou habitat on Moose River sub-unit.	Partially met – site-specific woodland caribou values protected through the development of AOCs; road rehabilitation rarely occurring; hardwood component increasing with careful logging in upland stands; uncertainty that unmanaged roadside slash impede caribou movement. See Recommendations 10, 14, 15

Objective		**Assessment - Auditor Comments**
Marten Habitat	To provide suitable marten habitat on the CMRMU.	Met. Considerable rationalized and supported adjustments to decrease original OWHAM capable area of 616,610 ha to 555,444 ha. Core area achieved was 10.2% (56,557 ha) but none of core areas meet 75% suitability criteria ranging from 49.1% to 74.4%. MNR provided adequate explanation for shortfalls, as follows: *Much of the Moose River sub-unit did not met marten guidelines criteria especially as they relate to tree height and suitable habitat. Modelling used tree heights of 15m for guidelines suitable and 12m for non-guidelines approach to defining suitability. Many stands were not 12m in height. Since 2000, the intent has been to incorporate caribou into marten cores to ensure the protection of contiguous areas of habitat that both species use. Trappers' records indicate good quality marten habitat on the landscape although the forest does not fit modelling criteria.*
Genetic Diversity	Ensure the genetic diversity of trees is conserved	Met - Current seed supply is sufficient to meet planned regeneration needs however age and viability of current white spruce seed inventory and lack of succession planning for aging black spruce and jack pine orchards raises concern regarding future seed inventory.
Forest Ecosystem Condition and Productivity Objectives		
Long-term Forest Health	Provide for the long-term health and vigour of forest by emulating natural disturbance patterns.	Met. Spatial patch analysis indicates movement towards natural patterns for disturbance patch frequency. Frequency of medium patches currently lower than targets and indicates future harvest patches should join smaller patches into medium size class to better match frequency targets. NDPEG applied during operations.

Objective		Assessment - Auditor Comments
Slash Reduction	Develop and implement a roadside slash reduction program.	Not met. Program developed but slash often not piled and rarely burned. Slash not re-distributed over cutovers or on roads. See Recommendation 14
Forest Productivity	Keep forest ecosystems productive.	Met- Total of 29,887 ha (138% of planned) surveyed during the term for FTG. 6,399 identified as NSR. Total of 1,444 ha of NSR area treated to meet minimum renewal standards. Two minor AOC infractions noted.
Productive CLAAG/HARP	Maintain the productivity of stands treated with careful logging and HARP techniques.	Not met – post-harvest surveys not completed, analysis and reporting of effectiveness not completed, slash seen to be reducing productivity of portions of many stands.
Conservation of Soil and Water Resources Objectives		
Water and Aquatic Habitat Quality	Minimize impacts on water quality and aquatic habitat within areas of harvest operations.	Met with minor exceptions. (AOC trespasses and improper setup on metal bridge documented in FOIPs)
Global Ecological Cycles Objectives		
Forest Conversion	Ensure that the available forest is protected from sustained deforestation or conversion to other uses.	Partially met. Areas covered with slash may be deforested for decades. See Recommendations 10, 14
Multiple Benefits to Society Objectives		
Wood Flow	Supply predictable, continuous and consistent flow of wood while maintaining forest sustainability.	Met – allocation identified sufficient area although available area not fully utilized.
Fur bearer habitat	Enhance fur bearer habitat on the unit.	Not Met. No evidence found to support operational consideration of this target. All riparian AOCs include statement "No forest management activities allowed in reserve."
Other Values	Ensure the protection of other values on the landbase (traps, protected areas, nesting sites).	Met. No reported or observed infractions.
Society's Responsibility for Sustainable Development Objectives		
First Nations	Relationship building with First Nation communities	Met. Consultation requirements were followed and ongoing efforts being made by both MNR and companies to engage First Nations. Economic opportunities available to the communities with varying levels of uptake. FN community representatives available for interview expressed no concerns.
Non-timber values	Ensure appropriate protection of non-timber values.	Met. Non-timber values surveyed and protected with appropriate AOC prescriptions.

Objective		**Assessment - Auditor Comments**
Forest Users	Conduct forestry operations so that all resource users may benefit and make compromises to ensure viability of the resource.	Not Met. No evidence found to support operational consideration to achieve this target.
Planning Inventory	Ensure that appropriate updates have been made to the planning inventory.	Partially met- there was a delay in the development of the 2010 FMP related to the approval of the planning inventory
Forest Stewardship Council Certification	To conduct forest management activities on the unit that contributes to Tembec's corporate objective of Forest Stewardship Council certification.	Partially met. Element 6.5.1 of the FSC Boreal Standard regarding loss of productive land is not met due to slash accumulation. See Recommendation 14

*Note that since the 2008-10 CP used the management direction from the 2003-08 FMP, the objectives were identical in these plans. Audit comments apply to achievement of the objectives in both plans.

Appendix 3 – Compliance with Contractual Obligations

The following table provides the status of the achievement of contractual obligations associated with the CMRMU.

Licence Condition	Auditee Performance
Payment of Forestry Futures and Ontario Crown charges	Partially Met – According to MNR records, as of May 2010 there was approximately $15,000 in outstanding Crown dues and none outstanding to the Forestry Futures Fund
Audit action plan and status report	Partially Met – An audit action plan and status report were prepared and all recommendations were fully addressed or partially addressed. The submission timelines for the action plan and status report were not met - see Recommendation 18
Forest renewal charges paid to Special Purposes Account	Met- No outstanding crown dues were owed to the Special Purposes Account
Eligible silviculture work	Met- Field analysis of FRT demonstrated that invoiced work was eligible
Forest renewal charge analysis	Met - A thorough forest renewal charge analysis was undertaken in 2006 & 2008. Existing silvicultural liability on the CMRMU is roughly $2,000,000. MNR to undertake an analysis of existing silvicultural liability for the Abitibi River Forest.
Special purpose account minimum balance	Met- SPA was above the minimum balance ($1,571,200) throughout the audit period. Account balance as of March 31, 2010 was $3,213,982.62

Appendix 4 – Audit Process

The Independent Forest Audit Process and Protocol (IFAPP) was developed by MNR to provide a comprehensive and consistent method of evaluating forest management activities on Crown land. The IFAPP (2010) states that the purpose of an Independent Forest Audit is to:

a) assess to what extent forest management planning activities comply with the Forest Management Planning Manual (FMPM) and the Crown Forest Sustainability Act (S.O. 1994, c. 25) (CFSA);
b) assess to what extent forest management activities comply with the CFSA and with the forest management plans, the manuals approved under the CFSA and the applicable guides;
c) assess the effectiveness of forest management activities in meeting the forest management objectives set out in the forest management plan, as measured in relation to the criteria established for the audit;
d) compare the forest management activities carried out with those that were planned;
e) assess the effectiveness of any action plans implemented to remedy shortcomings revealed by a previous IFA;
f) review and assess a licensee's compliance with the terms and conditions of the forest resource licence.

The IFAPP is based on eight guiding principles and contains 148 procedures, 123 of which are applicable to the CMRMU. Of that number a further 11 procedures were not audited due to sampling or by exemption under the IFAPP. The audit procedure serves as a framework to provide a structured approach to evaluating whether or not forest management activities meet the requirements governing forestry practices on Crown land in Ontario. The guiding principles are:

1. Commitment
2. Public consultation and Aboriginal involvement
3. Forest management planning
4. Plan assessment and implementation
5. System support
6. Monitoring
7. Achievement of management objectives and forest sustainability
8. Contractual obligations

MNR categorized the various IFA procedures based on complexity and their potential impact on forest sustainability. The IFAPP directs the audit team to assess through sampling, per audit principle and associated criteria, the three categories of procedures as follows:

- Administrative procedures – low (L) risk: 20-30% of L procedures to be assessed
- Administrative but also having a bearing on sustainable forest management – medium (M) risk: 50-75% of M procedures to be assessed
- Procedures directly related to sustainable forest management – high (H) risk: 100% of H procedures to be assessed

The lower range of the sample scale may be considered for forests certified in accordance with a sustainable forest management standard accepted by Ontario. The following table summarizes the number of procedures selected by the audit team for audit based on the direction provided by the IFAPP.

Table 4-1: Summary of the number of procedures selected by the audit team for audit based on direction provided in the IFAPP.

Principle	Procedures Audited by Risk Category							Comments
	Low Risk			Medium Risk			High Risk	
	Applicable (#)	Selected (#)	% Audited	Applicable (#)	Selected (#)	% Audited	Audited (#) (100% of applicable audited)	
1. Commitment	0	-	0	2	2	100	0	
2. Public Consultation and Aboriginal Involvement	0	-	0	6	5	83	2	
3. Forest Management Planning	6	2	33	12	9	75	39	Applicable procedures *not* audited: 3.2.2.1, 3.5.1.3, 3.6.1.1, 3.6.2.1, 3.6.2.2, 3.7.1, 3.10.2.1
4. Plan Assessment & Implementation	1	1	100	1	1	100	9	
5. System Support	0	-	-	1	1	100	1	
6. Monitoring	0	-	-	7	4	57	11	Applicable procedures *not* audited: 6.4.2, 6.4.3, 6.5.4
7. Achievement of Management Objectives and Forest Sustainability	0	-	0	2	1	50	15	Applicable procedure *not* audited: 7.1.7
8. Contractual Obligations	0	-	-	3	3	100	5	
Totals	7	3	50	34	27	76	82	

The audit process for the Forest consisted of eight main components:

1. Audit Plan: KBM prepared an audit plan that described the schedule of audit activities, audit team members and their qualifications, audit participants, and auditing methods. The audit plan was submitted to MNR, Tembec, AbiBow, FRMG, the Forestry Futures Trust Fund Committee, and the Chairs of the Cochrane, Kirkland Lake and Timmins LCCs.

2. Public Consultation: Several means of engaging consultation for the audit were used. Utilizing the MNR Cochrane District mailing list, KBM mailed letters to numerous parties advising of the audit and inviting their input. Mail-outs included a one-page survey to solicit public input to the audit process. The survey was also available to the general public on the KBM website (www.kbm.on.ca). Newspaper ads were published in six area newspapers prior to the pre-audit meeting advising the public of the upcoming audit, identifying the purpose of the audit and inviting the public to submit comments to the LCC Chair or directly to KBM.

3. Aboriginal Engagement: All seven First Nation groups associated with the amalgamated forest were contacted firstly by mail, then by phone. Personal interviews were arranged with representatives of Beaverhouse and Wahgoshig and telephone interviews were conducted with representatives of Matachewan and Flying Post. Attempts were made to interview Moose Cree, Taykwa Tagamou and Mattagami but these were unsuccessful. The Cochrane District Manager, MNR Aboriginal Liaison Officers and company staff were also interviewed regarding Aboriginal involvement.

4. Field Site Selection: The audit team conducted a preliminary site selection prior to meeting with Tembec, FRMG and MNR staff. GIS records, Annual Work Schedules and Annual Reports were used to determine the amount and type of forest operations carried out on the Forest during the audit period. A representative sample of sites was then selected to ensure field auditing of a cross section of all activities conducted on the Forest during the audit period. A pre-audit teleconference between MNR, Tembec, AbiBow (for the IFF), FRMG and KBM was held on August 19, 2010. Part of the pre-audit meeting was spent discussing the preliminary site selection and preparation of field packages with the companies and MNR.

5. Pre-audit Document Review: Prior to the September site visit, the audit team reviewed documents provided by Tembec, FRMG and MNR, including the:
   a) CMRMU 2003-2008 FMP and 2008-2010 CP
   b) Annual Work Schedules and Annual Reports associated with the 2003-08 FMP and 2008-10 CP.
   c) Comparison and Trend Analysis of Planned versus Actual Forest Operations Report (TAR)
   d) CMRMU Independent Forest Audit 2000-05 report
   e) CMRMU 2000-05 Independent Forest Audit Action Plan Interim Status Report.

   The audit team also developed a questionnaire that was circulated to planning team members and other Tembec and MNR District staff prior to the on-site audit to assess their perceptions regarding the effectiveness of specific components of forest management on the CMRMU. The results of the survey provided additional focus to IFAPP prescribed interview procedures that occurred on site.

6. On-Site Audit: The objectives of the field site visits were to confirm that activities were conducted according to plan, that they conformed to Provincial laws, regulations, and guidelines, and that they were effective. The opening meeting was held in Cochrane on September 13, 2010. During the on-site visit portion of this audit, the audit team spoke with staff of Tembec, FRMG, MNR, and LCC members. The audit team examined documents, records and maps at the MNR Cochrane District office, and spent two days in the field viewing selected sites. Audit activities including field visits were for both the CMRMU and Smooth Rock Forest IFAs. Representatives of Tembec, FRMG, MNR Cochrane District, MNR Forest Management Branch, and a representative of the Forestry Futures Trust Fund Committee accompanied the audit team during a portion of the field audit.

   Many stops provided the opportunity to audit multiple activities such as harvesting, renewal, values protection, etc. The following table presents the actual sampling intensity for each forestry activity examined on the ground as part of the field site visits. Due to access and time constraints, the audit team relied on a helicopter to reach many of the selected field sites. The helicopter also provided opportunities for overviews of the subject areas, enabling overall examination of target blocks.

Table 4-2: Audit sampling intensity for the Cochrane Moose River Management Unit.

Activity	Total Area or Number (2005-2010)	Area or Number Sampled	Percent Sampled
Harvest (ha)	8,247	882	11
Site Preparation (ha)	156	31	20
Artificial Regeneration – plant or seed (ha)	3,941	443	11
Natural Regeneration – CLAAG or clearcut for natural (ha)	1179	235	20

Activity	Total Area or Number (2005-2010)	Area or Number Sampled	Percent Sampled
Tending	4,982	514	10
Declared FTG (ha)	25,176	2,526	10
Area of Concern Categories[1] (#)	6	40	15
Road Construction (km)	12.5	35.6	35

[1] Area of Concern categories refer to the different types of AOCs present on the Forest. Examples include riparian reserves, cold water fisheries, eagle nests, etc. More than one AOC was associated with some sites selected for review of harvest and renewal operations.

7. The closing meeting was held in Cochrane on September 27, 2010. This meeting provided a forum for the audit team to present and discuss preliminary audit findings with Tembec, AbiBow (for the IFF), FRMG, MNR, FFTC and a representative of the Cochrane LCC.

8. Final Report: The audit results are presented in this report following a brief description of the audit process and the forest licence area under review. Within the report the audit team has made recommendations to address instances of non-conformance to a legal and/or policy requirement, or an identified lack of effectiveness in forest management activities. Two Best Practices were also identified for outstanding work.

   Recommendations from this audit must be addressed in an action plan developed by ARFMI and MNR Cochrane District, with input and review by MNR Kirkland Lake and Timmins Districts, and MNR Regional and Forests Branch representatives. MNR Regional and Forests Branch representatives will also develop an action plan to address any recommendations applicable to matters of forest management within the scope of responsibilities of these departments.

Fourteen responses to the public notices and survey were received. Commenter's areas of interest in forest management on the Abitibi River Forest were recreation, conservation, tourism, forest management practices, and Aboriginal rights.

Local Citizens Advisory Committees

Letters were mailed to all current members of the three LCCs on the Abitibi River Forest to notify them of the audit and invite their input. An LCC member attended the preaudit meeting conference call and telephone or in-person interviews were conducted with approximately 10-15% of the LCC members representing all three LCCs. Most had been a member greater than one year, with the majority having served on the LCC for more than four years. Members interviewed represented various stakeholder groups, such as the general public, government, trappers and the municipalities. Roles and responsibilities of members were discussed as well as the effectiveness of the group to fulfill the obligations set out in the LCC terms of reference. An LCC member attended the closing meeting.

Aboriginal Communities

A letter was mailed to each of the Aboriginal communities on the MNR District contact list inviting them to participate in the audit. The letter explained that their input is welcomed and encouraged them to contact KBM if they wished to participate in the audit or if they require more information before making a decision. Follow-up phone calls were made to further solicit input.

In-person discussions were held with members of Beaverhouse FN and Wahgoshig FN while telephone interviews were conducted with Matachewan FN and Flying Post FN. Both Beaverhouse and Wahgoshig representatives felt the relationship was good with MNR and while the Flying Post representative acknowledged they did not really have any involvement with forest management on the CMCMU, they wished to be kept informed. Attempts to interview representatives of Moose Cree FN, Taykwa Tagamou Nation and Mattagami FN were unsuccessful. A letter from the Métis Nation of Ontario was received prior to the audit voicing concern that they were not given the opportunity for a separate consultation process during forest management planning. At present the FMPM does not require a separate process be offered to Métis organizations.

The Cochrane District Manager, MNR Aboriginal Liaison Officers and company staff were also interviewed regarding Aboriginal involvement.

Overlapping Licensees, Contractors and Commitment Holders
All businesses listed in the MNR District mailing list were sent the one-page KBM survey and letter soliciting input to the audit. Interviews were held with two commitment holders.

SFL Holder
During the audit term the Forest was managed under an SFL by AbiBow, however, at the time of the audit, management of the Abitibi River Forest was being transferred to Abitibi River Forest Management Inc. ARFMI is described as a consortium of forest industries, ranging from small independent logging operators to large forest-products producers. It includes former SFL holders, Tembec and AbiBow. Day to day management is contracted to FRMG. Representatives of ARFMI, including AbiBow and Tembec staff, and FRMG participated throughout the audit process. The audit team appreciates ARFMI's and FRMG's efforts in preparing the audit field packages and supporting the audit process.

Ministry of Natural Resources
Interviews were held with Cochrane District staff including the District Manager, Area Supervisor, Area Forester, Area Biologist, Area Technicians and Aboriginal Liaison Officers. MNR District personnel from Cochrane and Timmins Districts also accompanied the audit team during portions of the field audit. The pre-audit meeting and audit opening and closing meetings were attended by MNR District personnel from the three Districts on the Abitibi River Forest. The audit team appreciates the cooperation and assistance provided by MNR Cochrane District staff in preparing the audit field packages and coordinating the field site visits.

One MNR Northeast Region representative participated in the preaudit meeting, portions of the on-site audit and the closing meeting. Two representatives from MNR Forests Branch attended portions of the on-site audit and the Branch was also represented during the pre-audit meeting and closing meeting.

Forestry Futures Trust Fund Committee
Representatives from the Forestry Futures Trust Committee participated in the pre-audit meeting via conference call, two representatives attended portions of the on-site audit, and one representative attended the closing meeting via teleconference.

Appendix 5 – List of Acronyms

ACOP	Annual Compliance Operating Plan
AOC	Area of Concern
AR	Annual Report
ARFMI	Abitibi River Forest Management Inc.
AWS	Annual Work Schedule
CEA(SFM)	Certified Environmental Auditor (Sustainable Forest Management)
CLAAG	Careful Logging Around Advanced Growth
CFSA	Crown Forest Sustainability Act
CP	Contingency Plan
CSA	Canadian Standards Association
EMS	Environmental Management System
EMS(LA)	Environmental Management System Lead Auditor
FFTC	Forestry Futures Trust Fund Committee
FMP	Forest Management Plan
FMPM	Forest Management Planning Manual
FOIP	Forest Operations Information Program
FOP	Forest Operations Prescription
FRI	Forest Resource Inventory
FRMG	First Resource Management Group
FRTF	Forest Renewal Trust Fund
FTG	Free-to-Grow
GIS	Geographic Information System
HARP	Harvesting with Advanced Regeneration Protection
IEA	Individual Environmental Assessment
IFA	Independent Forest Audit
IFAPP	Independent Forest Audit Process and Protocol
IFF	Iroquois Falls Forest
KBM	KBM Forestry Consultants Inc.
LCC	Local Citizens Committee
LTMD	Long term management direction
MNR	Ministry of Natural Resources
MOA	Memorandum of Agreement
MOE	Ministry of Environment
NSR	Not Satisfactorily Regenerated
RCCIM	Regional Community Constellation Impact Model
R.P.F.	Registered Professional Forester
RSA	Resource Stewardship Agreement
SEM	Silvicultural Effectiveness Monitoring
SEIM	Socio-Economic Impact Model
SFL	Sustainable Forest Licence
SFMM	Strategic Forest Management Model
SGR	Silviculture Ground Rule
SIP	Site Preparation
SMA	Selected Management Alternative
SRFF	Smooth Rock Falls Forest
TAR	Comparison and Trend Analysis of Planned vs. Actual Forest Operations Report

Appendix 6 – Audit Team Members and Qualifications

Name/Role	Mr. Rod Seabrook • Lead Auditor • Public Consultation
Responsibilities	Overall audit coordination and oversight of activities of the audit team; including public consultation; lead the assessment of achievement of management objectives, forest sustainability and contractual obligations.
Credentials	M.Sc. Biology; EP(EMSLA); 30 years forestry experience in Ontario; principal area of practice is forest management and environmental auditing; accredited by the Canadian Environmental Certification Approvals Board as an Environmental Professional specialized as an Environmental Management Systems Lead Auditor with a focus in Sustainable Forestry Management; member of the Auditing Association of Canada; Associate member of the Ontario Professional Foresters Association; eleven years of auditing experience; participated in over 20 Independent Forest Audits for the Province of Ontario. IFA experience covers all Crown managed forest types in Ontario; conducted sustainable forest management audits under the various recognized sustainable forest management standards in Alberta, Saskatchewan, Manitoba, Ontario, New Brunswick, Minnesota, South Carolina, Georgia, Mississippi, Alabama, and Texas; participated in over 100 3rd party audits to ISO 14001, CSA Z809, SFIS, FSC, and Chain of Custody standards.
Name/Role	Mr. Peter Higgelke • Wildlife/Ecology/Planning
Responsibilities	Inspect AOC documentation and practices; audit aspects of forest management related to environmental protection and wildlife practices; review access management program; review aspects of planning; assess achievement of management objectives, forest sustainability and contractual obligations
Credentials	R.P.F., M.Sc.F.; 29 years forestry experience in Ontario, Quebec, and Germany; served on one FMA Review and 16 IFAs, under a range of audit roles including Lead, Harvesting, Silviculture, Wildlife and Planning Auditor as well as auditing under FSC, including three forest management certification audits, three forest management scoping audits, six forest management surveillance audits and one chain-of-custody audit; completed ISO 14001 EMS Lead Auditor training through the Quality Management Institute in April 2006. Extensive knowledge and experience with wildlife and forest management as well as Aboriginal communities; interim plan author for the Lake Nipigon Forest 2010-20 FMP; primary areas of practice and disciplinary expertise are forest management, application development for the use of GIS technology in forest management, the integration of timber management and wildlife values, public participation in forest management planning, and participation by Aboriginal communities in forest management.
Name/Role	Mr. Laird Van Damme • Planning
Responsibilities	Assess adherence to forest management planning requirements; assess compliance and monitoring programs; assess achievement of management objectives, forest sustainability and contractual obligations
Credentials	R.P.F., M.Sc.F.; 23 years experience as a practising forester, educator and consultant; primary areas of practice are in the disciplines of silviculture, forest management and forest research; completed ISO 14001 EMS Lead Auditor training course through the Quality Management Institute; served as a forestry auditor on 14 previous IFAs and several certification audits; Lead Auditor on two IFAs; led the Model Forest Program evaluation and the last

	National Forest Strategy evaluation; authored four FMPs and published numerous scientific and professional papers as an adjunct professor at Lakehead University; consultant to the government of Saskatchewan on forest management planning standards and landscape planning projects in Alberta; peer reviewer of forest management plans and certification audits.
Name/Role	Mr. Brad Chaulk • Harvesting
Responsibilities	Assess harvest planning and operations, compliance and monitoring programs; assess achievement of management objectives, forest sustainability and contractual obligations.
Credentials	R.P.F., H.B.Sc.F.; 17 years of forestry experience; areas of particular experience include silvicultural practices and inventory systems including project management; diverse experiences as a tree plant supervisor, head of propagation and seedbed foreman at one of Ontario's largest nurseries, and as the supervisor and manager of technical services at KBM; member on 14 IFA teams; prepared pre-harvest and post-harvest forest operating prescriptions and developed preferred harvest strategies, site preparation techniques, and planting/tending regimes for individual harvest blocks; completed Managed Forest Tax Incentive Program plans for private landowners; conducted and written wood supply reports/timber analyses; considerable experience using the Forest Ecosite Classification systems for both Northwestern and Northeastern Ontario as well as the new Harmonized Ecosite Classification System for the Province; co-author Field Guide to Second Generation Progeny Test Establishment, Management and Assessment; plan author for the Black Sturgeon Forest 2006-2026 FMP; lead author of the Silvicultural Ground Rules for the Dog River-Matawin 2005-2025 FMP; project manager for both the Lake Nipigon Forest 2010-20 FMP and the English River Forest 2009-2019 FMP; certified to interpret aerial photography in Ontario's Boreal Forest; taught forest management planning at Confederation College.
Name/Role	Mr. Stephane Audet • Silviculture
Responsibilities	Assess renewal, tending and protection planning and implementation as well as silviculture monitoring, achievement of management objectives, forest sustainability and contractual obligations.
Credentials	R.P.F., with ten years of experience in the forestry sector. Primary focus on silviculture through managing site preparation activities, conducting forest inventory, regeneration and FTG surveys, tree improvement activities, cut block and road layout; contributed to a number of forestry consulting projects including wood supply analyses, customized operational costing matrices and wood supply contracting; silviculture auditor on the 2009 Trout Lake IFA.
Name/Role	Mr. Keith Hautala • Modelling
Responsibilities	Review SFMM strategic planning; assist in assessment of achievement of management objectives and forest sustainability.
Credentials	M.Sc.F.; 11 years of forestry experience in Ontario with an emphasis on long-term forest management planning, wildlife habitat analysis, strategic-level forest modelling, and forest auditing; participated in six IFAs in the position of Forest Modelling Auditor and an additional four as Secretariat; auditing responsibilities included reviewing assumptions, composition, and documentation of long-term strategic models, examining development and evaluation of management alternatives, and assessing achievement of management objectives and forest sustainability; teaches plant biology and wildlife courses at Confederation College.

Name/Role	Ms. Mary Anne Seabrook • Aboriginal Involvement
Responsibilities	Aboriginal involvement in forest management planning.
Credentials	Business Diploma. Ojibway descent; member of Red Rock Indian Band, located east of Thunder Bay. Strong background of working with First Nations organizations including the Ontario Metis and Aboriginal Association, the Red Rock Indian Band, Meno Bimahdizzewin Child and Family Service; served on Board of Directors for Native People of Thunder Bay Development Corporation; served as the team secretary on the Red Rock Indian Band Hydro Negotiating Team; involved in interviewing Michipicoten First Nation members to assess their skills and training requirements against work experience required for apprenticeship trades. Auditor on both IFA and FSC audit teams covering a total of seven audits.
Name/Role	Ms. Caleigh Sinclair • Audit Secretariat
Responsibilities	Provide general support in the execution of the IFA including logistics, evidence gathering, and report development. Assists in review of public consultation procedures and preparation of audit reports.
Credentials	H.BSc Biology; worked on a sea lamprey control program, as a resource technician, assistant planning biologist, acting planning biologist and renewable energy coordinator for the Ontario Ministry of Natural Resources. Currently main area of focus with KBM is renewable energy and environmental assessment projects.

Appendix 7 – Comparison and Trend Analysis Report

Comparison and Trend Analysis of Planned Versus Actual Forest Operations Report

for the

2010 Independent Forest Audit of the Cochrane-Moose River Crown Management Unit Cochrane District, Northeast Region

1570
P. D. FANTIN

Prepared by:
Paul Fantin, R.P.F.
Forest Program Manager
First Resource Management Group
(Acting as agent for Abitibi River Forest Management Inc.)

Date: August 19, 2010

ABITIBI RIVER
Forest Management Inc

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Introduction

This report details and summarizes harvest and natural depletions, silvicultural activities, regeneration assessments, road construction, maintenance, and compliance monitoring activities that have occurred on the Cochrane-Moose River Management Unit (the Forest). The Cochrane-Moose River Management Unit lies within the Ministry of Natural Resources Northeast Region, Cochrane District. Tembec Industries Inc. administered the Forest under agreement with Cochrane District until January, 2010 when First Resource Management Group (FRMG) assumed the management responsibilities for the landbase. As of April 1, 2010 the Cochrane-Moose River Crown Management Unit was amalgamated with the Nighthawk Forest, the Iroquois Falls Forest and the Smooth Rock Falls Forest into a single forest area named the Abitibi River Forest. As such, the 2010 IFA will be the last audit of the Cochrane-Moose River Crown Management Unit. At the time of this report preparation the SFL for the new amalgamated forest was being issued to Abitibi River Forest Management Inc. (ARFMI), a new cooperative based management company comprised of forest industry producers, forest harvesting companies and First Nations. The management of this SFL area is being carried out by FRMG under contract to ARFMI.

In anticipation of the amalgamation in 2010, a two year contingency plan was prepared for 2008-2010. The year-10 AR for the 2003 -2008 period was submitted in November 2008 and approved in 2009. At the time of this trend analysis report preparation only the data from the first year of the two year contingency plan is available therefore no meaningful trends can be interpreted from the 2008-10 contingency FMP. Therefore, the text describes trends and summarizes issues that emerged with the management of the Forest during the 2003 to 2008 period. The text further explains significant differences between the forecast five-year level of specific activities and the level of activity that was actually completed. The year-10 report that forms the basis for the trend analysis has been modified to include the tables and analysis requirements from the 2009 FMPM as per the direction in the Independent Forest Audit Process and Protocol (2010) and therefore will include data from the 1993-1998 TMP, 1998-2003 FMP, 2003-2008 FMP and one year of data from the 2008-2010 contingency FMP.

A number of significant events occurred during the 2003-2008 planning period. The following is a timeline of these events:

July 31, 2006: Tembec industries pulp mill was closed down in Smooth Rock Falls
Fall 2006: Deal signed between Canada and the United States ending the softwood lumber dispute
Fall 2006 to present: Labour dispute at the Grant Forest Products oriented strandboard (OSB) mill in Timmins. The mill has remained closed during this period.
Summer 2006 to present: Due to economic conditions and quota restrictions the Tembec Enterprises Inc. Timmins sawmill closed indefinitely

The most challenging issue that arose during implementation of the FMP was the harsh economic conditions impacting the Ontario forest products industry. During this time the industry faced challenges on a number of fronts including a Canadian dollar that reached a record high versus the U.S. dollar and a slow down in the U.S. economy fuelled by the sub-prime mortgage crisis which caused lumber demand and lumber prices to reach a 20-year low. These factors coupled with high fuel and energy costs drastically reduced harvest levels on the Cochrane-Moose River Crown Management Unit during the later part of the 2003-2008 and the 2008-2009 operating periods. Detail around these issues, its cause and the eventual results can be found in section 4.1.1 of this report as well as the assessment of objective achievement.

Management Unit Description and History

The Cochrane-Moose River CMU lies within the Ministry of Natural Resources Northeast Region, all in the Cochrane District (Figure 1). The Cochrane-Moose River CMU is an amalgamation of the former Cochrane Management Unit and the Moose River Management Units. The management unit is found in the Ministry of Natural Resources Cochrane District, northeast region.

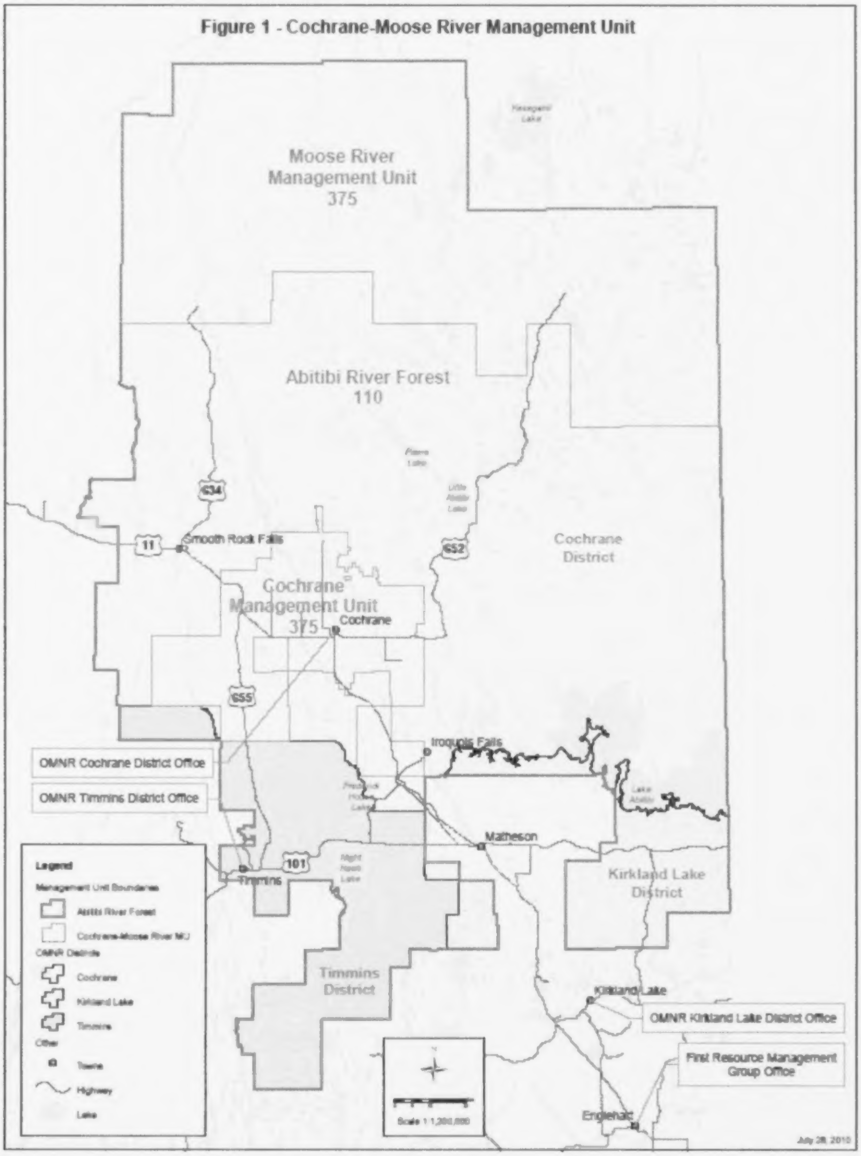
The northern portion of the CMU is made up by the former Moose River Management Unit and will be referred to as the Moose River sub-unit. This portion of the CMU borders the Quebec border to the east, the boundary of the area of the undertaking to the north, the Gordon Cosens Forest to the west, and the Smooth Rock Falls and Iroquois Falls Forests to the south. Forest harvesting operations commenced on the Moose River Management Unit in 1975. Harvesting during the 1975-85 period was permitted under a Volume Agreement with Normick Perron Inc., the original owner of the Cochrane sawmill.

Until 1984 the Moose River Management Unit included area from what is now known as the Moosonee Management Unit. Soon after the completion of a 1982 Forest Resource Inventory the Moose River Management Unit boundary was developed. The boundary changed by adding portions of the old Kesagami and Smooth Rock Management Units and excluding area from the Moosonee Management Unit. During this planning process the portion of the CMU referred to as the "tail" along the Abitibi River extending south into the Smooth Rock Falls Forest was removed and absorbed into the Smooth Rock Falls Forest.

The southern portion of the CMU includes the former Cochrane Management Unit and will be referred to as the Cochrane sub-unit. The boundaries of the Cochrane Management Unit were originally established in 1969. A realignment of boundaries occurred in 1987, with another realignment during the 2003 planning process. The OBM's surrounding the Town of Smooth Rock Falls and the OBM in the Inglis

Township were removed from the Unit and were amalgamated with the Smooth Rock Falls Forest during the 2005 FMP. Figure 1 shows the location of the Cochrane-Moose River CMU.

Figure 1. Cochrane-Moose River CMU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Abitibi River Forest 110
Cochrane District
Cochrane Management Unit 375
Smooth Rock Falls
Cochrane
Iroquois Falls
Matheson
Timmins
Kirkland Lake District
Timmins District
Kirkland Lake
Englehart
Lake Abitibi
634
11
652
655
101
OMNR Cochrane District Office
OMNR Timmins District Office
OMNR Kirkland Lake District Office
First Resource Management Group Office
Legend
Management Unit Boundaries
Abitibi River Forest
Cochrane-Moose River MU
OMNR Districts
Cochrane
Kirkland Lake
Timmins
Other
Towns
Highway
Lake
Scale 1:1,200,000
July 28, 2010

4.1 Implementation of Forest Operations - Trend Analysis

4.1.1 Harvest Area

The 1993 TMP's used forest units based on working group and site class. There were 4 spruce forest units: Sp1, Sp2, Sp3 and Sp4 which attempted to separate the spruce sites based on site class. The Other Conifer Fu was comprised of cedar and larch working group stands. The remaining forest units were comprised of working group stands. The 1998 FMP the forest units increased in complexity and moved from simple working group and site class amalgamations to groupings based on working groups, species composition and site class. The notable change was the first attempt in classification of stands into pure, mixedwood, and incidental forest units based on species composition. For the 2003 and 2008 FMP's further refinement occurred with the adoption of forest units based on the suite of northeast regional standardized forest units. This allowed classification of sites based to include forest cover types that could also be more closely compared to wildlife habitat types and ecosite classification.

Table AR-7 indicates the approximate grouping of the current forest units into the past plan forest units for comparison purposes. Since the forest units have changed between plans it is difficult to make individual forest unit comparisons and establish meaningful trends.

The history of this unit is one of under-utilization of harvest area. The actual depleted area ranged from 75% of planned in TMP 1993 to 66% in FMP 1998 to 44% in FMP 2003. After one year of depletion data for the 2008 contingency FMP only 17% of the annual available area was harvested. Since 2005 the under harvest can be attributed to poor markets for softwood lumber, pulp and paper, oriented strand board and hardwood plywood as a result of the recent global economic recession spurred by the collapse of the housing market in the United States and to a lesser extent Canada. Contributing to this was the countervailing duty applied to softwood lumber as well as the increase in the value of the Canadian dollar against the American currency making exports to the United States less attractive. In addition, high fuel and electricity costs and insurance premiums all conspired to increase production costs at a time when prices for forest products were in steep decline. Finally, in an attempt to minimize operational costs, some companies focused on sourcing fibre as close to the mill as possible in order to reduce haul costs thereby leaving more distant areas unharvested. Throughout this period the facilities in Cochrane, Timmins and Englehart as well as smaller mills all took operational downtime due to the lack of markets for their products. While the final 2009-2010 annual report information had not been compiled at the time this trend analysis was completed is likely that this trend will persist through to the end of the two-year term.

Further historical analysis is provided for the Cochrane and Moose River sub-management units.

Cochrane sub-MU

For the 1993 – 1998 plan term there was a significant under-achievement of the planned harvest area. The DCL's did not harvest their anticipated volumes (DCL's were limited to 65 ha per year until 1995). Approximately 30% of the Cochrane FMP was not harvested.

For the 1998 – 2003 plan term there was a significant under-achievement of the planned harvest area. In the 1998-99, 2000-01, and 2001-02 annual reports it was noted that several of the licensee's did not harvest their full allocation and there were instances where licensee's had outstanding management fees and did not harvest.

Moose River sub-MU

For the 1993 – 1998 FMP the harvest area was under-achieved by 23%. A bump-up request during plan development that was not settled until late in the plan term resulted in harvest area left standing. Some of the area substituted in the FMP required long access routes for relatively small amounts of wood. Others required returning to areas previously harvested where the majority of the volume had already been harvested. As a result many of these areas were left standing. The most significant underachievement was in the SP2 and SP3 forest units.

For the 1998 – 2003 FMP the harvest was significantly less than planned. Operational decisions to harvest volume from other forests that were near the end of their terms reduced the harvest level on the management unit. Construction of the Chabbie Road, which was scheduled to begin in 1998, did not proceed on time due to the late approval of the FMP. This road construction did not begin until the 1999 – 2000 AWS year reducing the area available for harvest. As well, the lack of aggregate slowed road construction and dramatically increased cost. In addition, First Nation issues emerged as the plan progressed resulting in a number of blocks being left partially un-harvested. The softwood lumber dispute further reduced the demand as the Cochrane mill went to one shift. The completion of the OLL boundaries also resulted in blocks being un-available for harvest. An amendment to replace these blocks was never processed. Bypass levels in the last 3 years of the FMP were also significant. Inaccuracies in the FRI were significant and bypass was primarily due to small wood size. Again the most significant underachievement was in the SP2 and SP3 forest units.

For the 2003-2008 FMP the harvest area for the 2003-2004 AWS was well below the average annual planned in the AWS. Harvest in the Cochrane area was focused on other forests in the district that were approaching the end of their plan terms. Continuing pressure as a result of poor lumber prices, and the US softwood lumber countervail duties resulted in the short term shut down of the Cochrane sawmill that in turn temporarily reduced demand for fibre from this forest.

4.1.2 Harvest Volume

Table AR-8 details planned vs. actual harvest volume. As with the harvest area, the harvest volume achievement has consistently been under the planned volumes

During the 1993 - 1998 plan term, the actual harvest volume was 81% of the planned for all forest units with 95% and 44% achievement for SPF and Po/Bw respectively. In addition to the factors described in 4.1.1, indications from past RPFO's are that there were discrepancies between FRI based estimates and actual recoveries. For the 1998-2003 period the actual harvest volume was 57% of planned with 59% and 49% achievement for SPF and Po/Bw respectively and for the 2003-2008 FMP period the actual total harvest volume was 42% of planned with 44% and 35% achievement for SPF and Po/Bw respectively. Underachievement of volumes for this period has been attributed to the under-harvest of area as described in 4.1.1

For the first year of the 2008 contingency plan the achievement was 19% of planned with 18% and 29% achievement for SPF and Po/Bw respectively however at this time no trends can be determined from this data.

For the 1993, 1998 and 2003 period actual SPF recovery in m3/ha was 79, 111 and 100 % of planned respectively. These figures particularly for the 1998 and 2003 are acceptable estimates and confirm that the yield curves are not the primary contributing factor to volume under achievement. For poplar/birch the actual recovery trend was to significantly over achieve the planned volumes (i.e. 172%, 137% and 126% of planned for the three periods) and as described above, it is likely that the FRI based estimates are the source of the error.

4.1.3 Renewal and Maintenance

Table AR-9 provides a comparison of renewal and tending activities for the 3 plan terms and the one year of the 2008 contingency plan. No protection efforts were either planned or carried out during the term of this report.

Natural Regeneration

Natural regeneration for the 1993 to 1998 plan term shows significant short fall in actual vs. planned levels of natural regeneration. The 1993 - 1998 Report of Past Forest Operations noted that the status of natural regeneration was incomplete and that there were inconsistencies in reporting.

Over all there was an 85% actual achievement of natural regeneration for the 1998-2003 period. For the Moose River Sub-MU natural regeneration showed a shortfall from the planned level of natural regeneration. The shortfall was caused by the shortfall in the total harvest. For the Cochrane sub-MU the natural regeneration had exceeded targets set out in the FMP. Natural regeneration levels were higher than anticipated with a significant portion of the area harvested using careful logging.

For the 2003-2008 FMP the actual natural regeneration area was 25% of planned which represents a significant underachievement for the period. It is apparent that reporting on natural regeneration was postponed into the next period. In order to correct this error ARFMI has undertaken a forest-wide survey in 2010 in order to assess the current status and effectiveness of silvicultural treatments areas for all depletion areas that have not yet been declared free to grow. In the future a more consistent annual approach to reporting on natural regeneration areas will be undertaken.

Artificial Regeneration

For the 1993-1998 period artificial regeneration targets were consistently over achieved for planting and seeding (255% and 255% respectively). The most probable reason that the actual planting areas exceeded the planned levels was that additional funding was made available for renewal efforts on the unit. The same trend holds true for the site prep levels (109% of planned). The over achievement or underestimation in funding may have been in part due to the funding levels experienced from the 1988 to 1993. Moving forward, more attention will be made to accurately projecting and meeting artificial regeneration targets.

Aerial tending for the 1993 – 1998 plan period was 105% of the forecasted area. No prescribed burning operations were conducted during the plan term.

Treeplanting for the 1998 – 2003 period was 82% of the planned area forecasted for treatment. For the Cochrane sub-MU there had been a significant underachievement of planting compared to the Moose River sub-MU. Mechanical site prep was carried out on 21% of the planned area through forestry futures funding. Forecast direct seeding for the 1998 plan was based on historic direct seeding levels. Experienced and information gained throughout the development of the 1998 plan showed that sites suitable for direct seeding were also suitable for natural regeneration through careful logging.

Aerial tending during the 1998-2003 plan term was less than forecasted in the FMP with a 53% achievement from planned levels. The reduction in levels of tending is a reflection of the move in operational area from Fraserdale to the Chabbie and Kesagami areas, where sites tend to be less competitive as well as the deferral of a large spray program scheduled in 2002 due to late publishing of public spray notices.

In the 2003-2008 FMP artificial regeneration was forecasted to make up approximately one third of renewal efforts. Both tree planting and seeding exceeded planned levels. While mechanical SIP levels were less than planned the use of chemical treatments and slash pile burning were implemented and made up the difference with an overall overachievement of SIP targets of 179%. The actual tending achievements were 98% of planned levels.

4.1.4 Harvest and Regeneration

A summary of the harvest and regeneration trends is reported in Table AR-10. This table reports harvest and regeneration trends for the 1993 to 1998, 1998 to 2003, 2003 to 2008 five-year planning terms and includes the total harvest area for the 2008-2009 year. Effectively regenerated area is reported in Table AR-10 by the year in which it was harvested. As can be seen in the table, the general trend over time is that the areas harvested on the crown management unit are being successfully regenerated.

The total depletion hectares reported in Table AR-10 for the 1993 to 1998 term was 21,029 ha. During the 1998 to 2003 term the total hectares of depletion reported was 16,798.7 ha. The 2003 to 2008 term had a total of 9,722.8 ha depleted and for the 2008-2010 period 745.9 ha have been depleted. Due to the variation in Forest Units over time and the related difficulty in drawing trends at the forest unit level the data has been aggregated for all forest units. In addition, in order to account for discrepancies in historical data and to maintain continuity in the analysis, the information for the 1993-98 and 1998-03 periods was taken from the approved 2005 IFA trend analysis rather than from past annual reports.

Based on the information above, 56 percent of the area depleted between 1993 and 1998 is now successfully regenerated. The balance of the area not yet assessed as regenerated is as follows: on the Moose River subunit; 3,007 ha harvest assessed as low management (NSR) of which 51 ha now within OLL's; 2,680 ha harvest not assessed of which 2,006 ha are now within OLL's, 1,410 ha are plantations of which 304 ha are now within OLL's, and 987 ha of aerial seeding projects all of which is now contained within OLL's; on the Cochrane subunit 403 ha assessed as low management, 233 ha not assessed, and 389 ha of plantations. Of the plantations mentioned above on the Moose River subunit 1,184 ha were planted following regeneration assessment of old careful logging practices in 1998 or later and are due for assessment during the period 2008-2012. Of the 3,348 ha not yet assessed as free growing within the OLL's, there is no intent or obligation on the SFL holders part to conduct any treatment or assessment of the areas. The balance of the NSR areas will not be addressed until the new forest resources inventory has been completed, as some of these areas will be re-classified through that update. Once a new inventory is completed, implementing an assessment/treatment strategy for areas which the SFL holder is responsible will have greater utility.

For areas harvested during the 1998 to 2003 term, most of the areas would not normally receive an assessment until after the 2008-09 period due to the slower growing climate of the Moose River subunit. However, 16% of harvested areas have been assessed as effectively regenerated to date. A portion of the areas not assessed would have been assessed in 2007 however the program was reduced due to staffing issues. This single year shortfall as already been compensated for during the 2008-09 season.

Of the harvest areas depleted between 2003 and 2008, 10 ha have been assessed as a regeneration success. Most areas are normally assessed 9 to 12 years following harvest/treatment. This area is of PO1 and SBC forest units and its status was recorded during an adjacent assessment.

4.1.5 Forest Condition

Table AR-11 provide a combined summary of the Crown managed landbase for both the Cochrane Management Unit and the Moose River Management Unit. The landbase summary for the 1993 and 1998 plan terms applies to the same boundaries, but the 2003 plan term is based on the sub-unit boundaries as they appear in the 2003 FMP. For the Moose River sub-unit the portion of the unit known as the "tail" south of Fraserdale now forms part of the Smooth Rock Falls Forest.

In the 1993 Moose River Plan the unit was separated into two working circles, one working circle was defined as accessible and the other inaccessible in the long term. The managed landbase reported for the 1993-1998 term represents working circle 1. The increase in the total production forest in the 1998 plan is a result of the elimination of the working circles and the inclusion of all production forest on the unit. The Cochrane District Remote Wilderness (Tourism) Strategy removed a 67,920 ha section of land in the middle of the unit. This land withdrawal resulted in a decrease of 28,723 ha of managed productive forest in the 1998 Plan. In the 2003 FMP the total productive landbase for the Moose River sub-unit decreased by over 54,000 ha, primarily due to the formation of protected spaces through the OLL process, and to a lesser extent the removal of the "tail" from the unit landbase.
Further significant events that occurred on the unit in 1995 were 3 major wildfires. These wildfires covered 23,755 ha and resulted in 15,000 ha of free-growing forest shifting into the not-satisfactorily-regenerated (NSR) land classification. The area burned by the largest of the 3 wildfires has since been included in part of the Ontario Living Legacy (MNR, 1999) land withdrawals There have been no significant natural disturbances since the fires in 1995.

On the Cochrane sub-unit the 1993 and 1998 plan periods reflect the same landbase. For the 2003 FMP portions of the unit around the Town of Smooth Rock Falls and the Township of Inglis were removed from the landbase and included in the Smooth Rock Falls Forest. This has resulted in the decrease of the production forest. There was a

significant decrease in the amount of barren and scattered and not sufficiently regenerated between the three plan terms due to re-classification of lands due the FRI updating processes during the production of the 1998 and 2003 FMP's. There were no significant natural disturbance events during this period.

Significant changes to the managed landbase on the unit in recent history make it difficult to accurately track any landbase changes over the three plan periods.

4.1.6 Habitat for Species at Risk and Selected Wildlife Species

Data on the habitat for selected species is available from the 2003 planning period only. Since the 2008 plan was a 2 year contingency the strategic direction from the 2003 plan was utilized. Table AR-12 provides a summary report of the selected wildlife habitat results taken from the 2003 FMP. Overall the acceptable habitat levels were achieved. The 2003 FMP was written prior to the 2007 endangered species act. Of the species detailed in AR-12 only the woodland caribou is listed as Threatened. The habitat of this species is projected to decline slightly based on the current management strategy between 2003 and 2103. A two-year contingency plan was developed for 2010-2012 to allow the implementation of the Caribou Habitat regulation under the Endangered Species Act. At the time of preparation of this report the regulation had not been implemented however the planning team for the 2012 FMP has committed to implement the caribou habitat requirements detailed in the Caribou Conservation Plan, including the development and implementation of a dynamic caribou habitat schedule intended to provide for the habitat of woodland caribou for a period exceeding 100 years.

4.1.7 Monitoring and Assessment

No significant trends could be identified based on NIC occurrences from the historical information since 2002. As illustrated below some assessment of historical trends by operator as well as by NIC occurrence type is considered when trying to provide analysis to these occurrences. Although total number of occurrences are down from the average occurrences this also needs to be set in the perspective that overall operations by all licenses was significantly less in 2007/08. As in past years based on infraction occurrence type boundary/AOC line trespass remains the most consistent non-compliant activity across all operations. This fact points to the need for continued vigilance at the field level and continued education and re-enforcement at the operator meetings. In addition, a standardized line marking methodology will introduce a consistent approach that is expected to remedy the trespass issue.

Table 1. CMRMU Non-Compliance Issues by Year by Licensee

Licensee	2002	2003	2004	2005	2006	2007	Total
Tembec	1	5	3	1	4	2	16
Norbord	1	0	0	0	0	0	1
Independents	4	0	1	15	1	1	22
Total	6	5	4	16	5	3	39

Figure 2. CMRMU Non-Compliance Issues by Year and Licensee

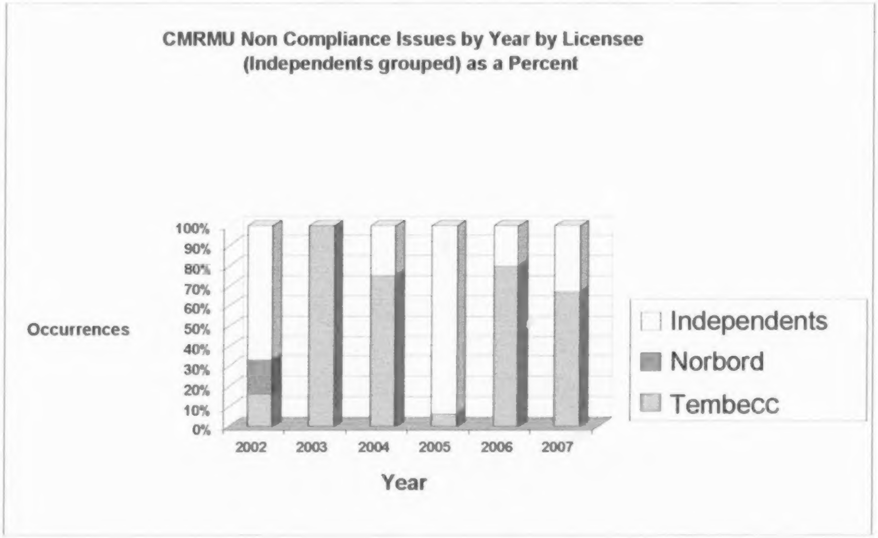


Figure 3. CMRMU Non-Compliance Issues by Year and Group

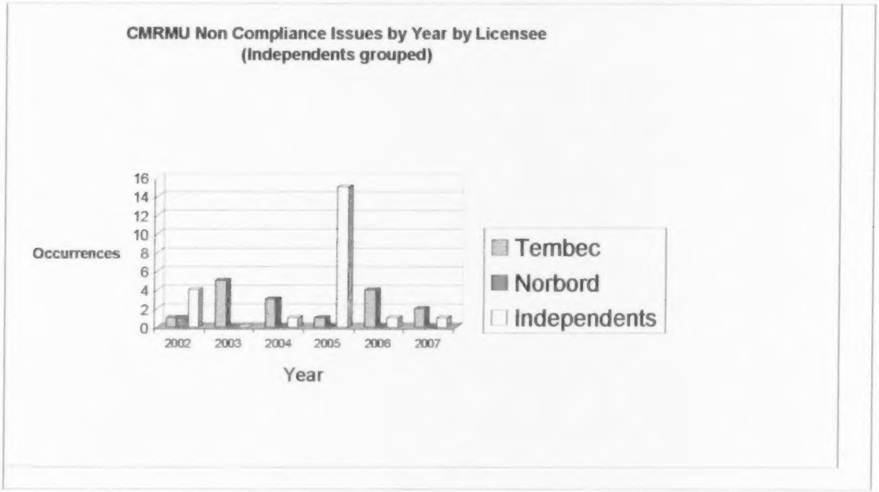


Table 2.CMRMU Non-Compliance Issue Infraction Type by Year

Infraction Type	2002	2003	2004	2005	2006	2007	Tot.
Trespasses: boundary/AOC/NDPG/access Roads	5	3	2	12	3	3	28
Trespasses: tree plant/aerial spray	0		2	0	2	0	4
Wasteful Practices: merchantable timber/high stumps	1		0	2	0	0	3
Harvest without Authority	0	1	0	2	0	0	3
Site Damage	0	1	0	0	0	0	1
							39

Figure 4. Non-Compliance Issues by Year and Type

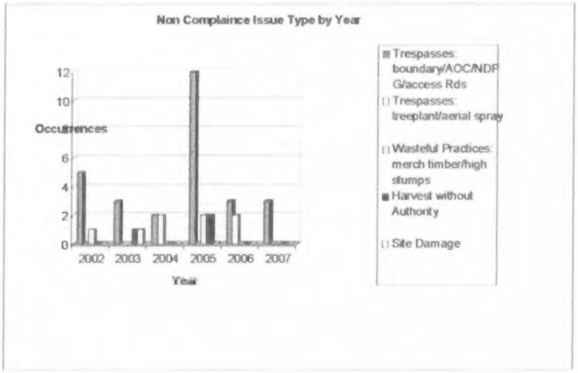
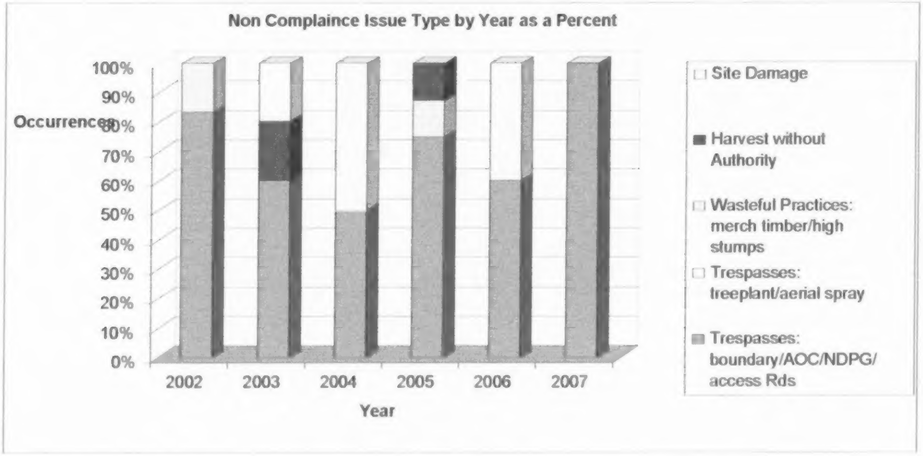


Figure 5. Non-Compliance Issue Type by Year as a Percent



Conclusions

The following actions are some mechanisms (not exclusive) that the District will undertake to assist in limiting future concerns on the priorities:

Trespasses:

- Continued education/training with reinforcement of proper procedures and requirements for line marking on harvest and access operations (on AWS approved areas as well as adjacent to private land) through the annual General Independent Operators Meeting and licensee pre operations license meeting.
- Identification and expectation of licensee personal and MNR staff who should /could be communicated with for guidance or direction during operations (compliant and non compliant instances).
- MNR increased monitoring or auditing of high risk operations (operations or operators with history of infractions, significant and/or multiple values).
- Progressive use of compliance and enforcement remedies for instances of non-compliance.

Utilization:

- Continued education/training on utilization standards and expectations for marketing of licensed merchantable timber through the annual General Independent Operators Meeting and licensee pre operations license meeting.
- Identification and expectation of licensee personal and MNR staff who should /could be communicated with for direction and or authority amendments if wood

marketing requirements change during operations

- MNR communicate to all licensees the Regional Director direction that all merchantable wood harvested is to be forwarded to roadside.
- MNR ensure licensees have mill commitments (markets) for species and volumes prior to license or approval issuance and any declaration of merchantability vs. marketability restraints on the license area.
- MNR monitor and report on utilization for completed operations during compliance activities on the Independent Licensees operations.
- MNR continue to audit self compliance licensees completed harvest and access operations with increased monitoring on operators or operations that are of increased risk.
- Progressive use of compliance and enforcement remedies for instances of non-compliance.

There were no exceptions on the Cochrane-Moose River Management Unit during the 2003-2008 period.

Assessment of Regeneration and Silvicultural Success

AR-13a reports the assessment of regeneration success for the 2003-2008 period. The Forecast of Assessment is taken from FMP-28. The overall total area assessed during the FMP term was 31,609 ha or 138% of the FMP term objective. AR-13b represents the results of one years survey in the 2008-2010 period. No attempt to draw trends from this data will be made until the completion of the 2009-10 AR data.

A total of 9,808 ha or 31% of the total area assessed as Not Sufficiently Regenerated (NSR) during the 2003-2008 FMP term. The following is a breakdown by NSR class; There is 40% of the area surveyed in this period that requires a tending application (NSR 2) of which a total of 2,884 ha or 76% has already received a tending application and will be scheduled for future follow up survey. NSR class 3 - 5% which includes areas that have not regenerated to satisfactory stocking but could reach stocking standards through normal treatment methods at normal costs. These areas need to be ground checked prior to the implementation of any treatments, the intent is to treat these sites within the next plan term in order to reduce the amount of Class 3 area; NSR class 4 – 20% of these areas have not regenerated to satisfactory stocking and cannot reach stocking standards through normal treatment methods at normal costs. Usually these older cutovers have a heavy standing residual content or difficult terrain. The majority of this area is area is within a 1,600ha fire in the Kesagami Operating Area, the intent is to re-survey the area in 2010, sites still not meeting minimum stocking standards would need ground checking prior to the implementation of any treatments.

The intent is to seek outside funding to treat these sites within the next plan term to reduce the amount of Class 4 area; NSR class 5 – 19% of these areas have not regenerated to satisfactory stocking and cannot reach stocking standards through normal treatment methods at normal costs. Usually older cutovers with very heavy residual content, wetness, and very difficult terrain and or access problems these sites cannot reach stocking standards with existing technology except at cost 100% or greater than current costs. The majority of the Class 5 area on the Moose River sub unit is within a fire, the intent is to re-survey the area in 2010, if at that time there is area not meeting the minimum stocking standards outside funding sources will be sought for implementing appropriate treatments to bring the site back to a free to grow status. The Cochrane sub unit has a large amount area (1,200ha) in Class 5, the areas are small and scattered throughout the management unit. More than half the Class 5 area consists of blocks less than 20 ha in size which will make for some operational challenges. These scattered areas will be captured as part of the new forest resource inventory being completed for the CMRMU, areas not meeting minimum stocking standards will have to be looked at for treatments to reduce the amount of Class 5 area on the landbase. The balance of the area or 17% consists of NSR Class 6, which is a category for stands that meet all Free to Grow criteria with the exception of height, therefore more time is required to re-assess for FTG status, assessments of these areas are scheduled to start in 2009 and be completed in 2010. Due to high costs and complexities with treating the NSR Class 4 and 5 sites an analysis of the options should be developed with the MNR District staff and FRMG jointly.

The Cochrane District MNR conducted ground verification of Tembec's Free to Grow submissions over three consecutive seasons, 2006 to 2008. Joint meetings were held in May 2007 and June 2008 to discuss variance in results. Some of the variance may have been a reflection of inexperienced personnel conducting the assessment or a third party conducting assessments on the Cochrane sub unit for several years; the accuracy of these assessments has not been confirmed. The MNR and Tembec had agreed to create action plans to address the following;

- Follow up inspections on the ground of areas with large discrepancies between Tembec and MNR results.
- Joint ground surveys for a couple of areas prior to starting the aerial FTG survey program to ensure consistency.
- Joint aerial inspections for the entire program to ensure consistency.
- Review at the end of each year to compare ground and aerial results and to continuously make improvements where required.

On the Cochrane Moose River Management Unit 50% of the area successfully regenerated did not regenerate to the (supposed) projected forest unit. There are several reasons why Table AR-13a shows results the way that it does. Firstly, area now being assessed for regeneration success was, in the norm, originally depleted 10 or more years ago. At that time the forest management plan in place did not tract Forest Operations Prescriptions (FOPs). Without an existing FOP to report against each regenerating stand in AR-13a was been assigned a FOP based on digital records of silviculture treatments. Without knowing the original intent of the original silviculture treatment this is the best that can be reported. Secondly, much of the area assessed during the 2003-08 term is on the Cochrane subunit. The area on the Cochrane subunit was mainly backlog area that the District had not been provided funding for to update. Because of the age of some of these stands normal assumptions on renewal trends my not prove warranted. Also, regenerating areas on the Cochrane subunit have some anomalies in treatment as can be seen from AR-13a. There are many hectares where rich sites were planted and follow-up tending did not occur as may normally be expected or tending occurred late after competing brush was well established.

Because of the backlog nature of the regeneration assessments and the difficulties with determining the exact causes of variance in regeneration to 'forecast' forest units these results were not incorporated statistically into the Cochrane Area Forest FMP now under development. The results are not comparable to current practices and therefore to the assumptions used in the 2003-08 strategic model as results of 'normal' treatments. Instead these results should be viewed anecdotally and professionally as what may happen when all of the prescribed treatments in a silviculture treatment package are not completed as planned.

For the development of the 2010 contingency FMP, the Long Term Management Direction summary (Section 3.0) describes how actual forest regeneration results were considered during the development of sfmm inputs.

The starting point for the SFMM post renewal succession rules were the NHF 2008 FMP inputs and the silvicultural effectiveness monitoring data available compiled by the MNR. The post renewal succession rules also considered the actual silviculture program results for the Iroquois Falls Forest. An iterative review and adjustment process was followed to define the final post renewal succession rules. The post renewal succession was identical on the three claybelt forests (i.e. Iroquois Falls Forest, Smooth Rock Falls Forest and the Cochrane Moose River management unit) owing to similar species and forest unit composition of these forests (i.e. mainly lowland black spruce with limited upland conifer, hardwood or mixedwood forest units and very limited cedar, white birch, red and white pine, other hardwood, and jack pine species composition.

The key assumptions were:

- extensive renewal was expected to increase hardwood species compositions based on the initial hardwood composition;

- basic, intensive, and elite renewal was expected to increase the conifer component through planting in most cases;
- if there was a spray it was expected to reduce or eliminate the hardwood composition and increase the conifer composition
- all renewal was expected to maintain the regeneration treatment intensity, except for failures where hardwood or mixedwoods were expected to be extensive, extensiveW or basic1; and,
- the Bw1 and Mwd basic yield intensities were created through increased conifer composition through planting failures or planted areas not sprayed;
- the extensiveW yield intensity and post renewal was designed to reflect increased hardwood regeneration and composition resulting from winter harvesting of the Po1, Po3, Mwd, and Bw1 forest units which provides nutrient loaded root systems for spring suckering.

For the development of the 2012 Forest Management Plan for the Abitibi River Forest, the planning team will be required to review all of the MNR's silvicultural effectiveness monitoring data as in combination with the silvicultural survey results and integrate this data into the post renewal forest succession inputs with associated yield curve adjustments. This will ensure that the future forest model outputs best reflect the expected outcomes of the various silvicultural treatments utilized on the forest.

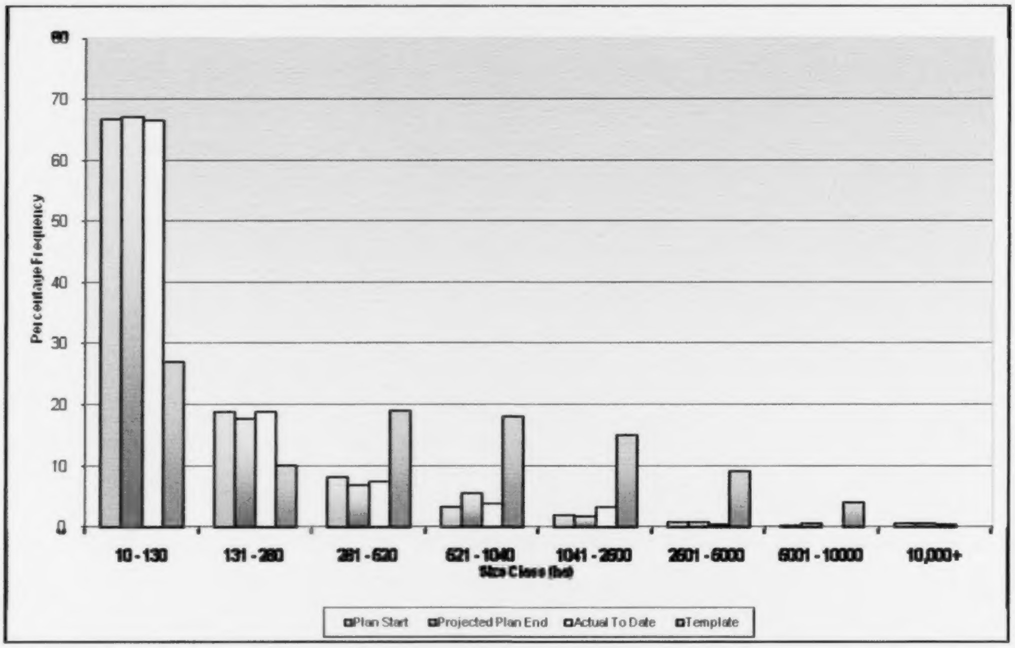
4.2 Analysis of Forest Disturbances

The following is an analysis of forest disturbances from the 2003-2008 yr 10 annual report.

The size and frequency of forest disturbances created by harvest and natural disturbances are reported in AR-15. The size classes used in the table match those used in the 2003-2008 FMP and the 2008-2010 Contingency FMP. The actual to date values reported in the table were determined using the method outlined in the 2003-2008 FMP using the actual 5 yr depletions. The size and distribution of the areas selected for harvest operations in the 2003-2008 FMP were planned in order to provide a range of disturbance patch sizes that emulate a more natural condition (landscape disturbance pattern) as described by the Forest Management Guidelines for the Emulation of Fire Disturbance Patterns – Analysis Results (FMGENDAR) for site region 3-E.

The "Actual to Date" disturbance regime is different from the "Projected Plan End" due to the underachievement of harvest targets, the graph below compares the "actual to date" forest disturbance regime percent area by size class as compared to the "projected" disturbance regime. Lower than projected harvest levels changed the balance of disturbance classes most noticeably in the 1041-2500 ha size class as compared to the "projected" disturbance regime. It also resulted in the elimination of the 2 "projected" disturbances in the 2,500-5,000 ha size class, 2 in the 5,000-10,000 ha class and one in the 10,000+ class. This in turn resulted in an increase in the "actual" percent area in the 131-260 ha to 261-520 ha size classes.

Figure 6. Frequency Distribution of Forest Disturbances by Size Class



In 4 out of 7 size classes where disturbances were "projected" to move towards the frequency template the "actual" achievement moves none of the size classes toward the template. In the 10-130 ha and 1041-2,500 ha size classes the "projected" disturbance regime was expected to move away from the template. The opposite was true for the "actual" disturbance regime which shows movement towards the template.

Although the "actual" disturbance regime shows some movement toward the template (natural condition), several years of harvest will be necessary to strictly match the template condition. The requirement for more recent FMP's to maintain 80% of planned clearcuts less than 260 hectares in size by frequency (strict standard set by the *Forest Management Guide for the Natural Disturbance Pattern Emulation*), limits to potential to plan for new large disturbances and achieve the frequency levels for the larger size classes. Future reporting of disturbance regimes would be better measured by percent area by size class as measured against a template and the required table in the Annual Report should be altered accordingly.

For the development of the 2010 contingency FMP, the landscape indicators were developed for the entire Abitibi River Forest and not assessed to the sub-management unit level therefore an analysis of harvest and natural disturbances for the Cochrane Moose River CMU was not produced.

For the 2012 FMP for the Abitibi River Forest the implementation of NDPEG will be replaced by the direction in the draft Landscape Guide (science package results) for the forest. The BFOLDS outputs will provide the target achievement ranges for landscape level indicators. In addition, a significant strategic shift in landscape level planning will be implemented with the application of the woodland caribou conservation plan requirements for the forest. The application of a Dynamic Caribou Habitat Schedule will result in the development of relatively large landscape patches designed to enhance long term caribou habitat, rather than to specifically meet natural disturbance template size class targets.

4.3 Analysis of Renewal and Tending Activities

Refer to Section 4.1.3, 4.1.4 and 4.1.7 for a discussion on the trends in renewal and tending. For the 2003-2008 FMP SPA expenditures forecast of $4,169,000 ($833,800 per year) was very close to the actual expenditure level of $4,948,510 ($989,702 per year) indicating the planned silviculture program was implemented. For the 2008-2009 season the total silvicultural expenditure to date is $381,240/yr which is 96% of the FMP forecast of $396,000/yr.

4.4 Review of Assumptions in Modelling

Several assumptions were made for inputs into the Strategic Forest Management Model (SFMM) for the 2003-2023 FMP to produce the selected management alternative (SMA). These assumptions are related to forest dynamics and development information, natural depletions, anticipated industrial demand and silvicultural funding levels. Those modeling assumptions, which have been reviewed, and their validity examined, are listed below:

- Forest Development Information (yield curves)
- Natural Succession
- Natural Disturbance Rates (Pre-suppression and Post suppression Fire Cycles)
- Post Harvest Succession inputs – Silvicultural Treatment Proportions
- Clearcut Forest Renewal Costs - $/ha and seedlings/ha
- Annual Seedling Requirements/Silviculture Expenditures
- Area Forecast to Revert To Roads And Landings
- Growing Stock Volumes Left Unharvested

- Commercial and Pre-Commercial Thinning Treatments Options

Forest Development Information (Yield Curves)

In the 2003 FMP, projections of forest growth were generated for each forest unit using the forest resource inventory (FRI) and the Northeast Regional pure species yield curves produced by the MNR's Northeast Region Science and Information (NESI) branch and incorporated in SFMM Tool. Pure species yield curves are intended to reflect pure, fully stocked stands on specific site classes. Using SFMM Tool a weighted average site condition approach was used to develop the yield curves. This approach adjusts pure species yield curves with stocking and species composition information specific to each forest unit and age class. To produce these weighted average site conditions, a weighted average stocking and species composition is calculated for each forest unit. Because this method relies heavily on the accuracy of FRI to predict average site conditions (i.e. average species composition, average site class and average stocking) inaccuracies in the FRI may have a greater influence on the accuracy of yield predictions than the pure species yield curves themselves.

The following observations were made based on the assumption that that the 2003 FRI was able to accurately predict average site conditions. Based on a comparison of forecast harvest volumes versus actual volumes, the following is noted;

- The present yield curves for the PO1 forest unit over estimated poplar volume by approximately 30% on the Cochrane sub-unit (based on input from Norbord).
- Poplar volumes in all forest units appear to have been over estimated. Poplar volumes utilized were 38.9% of the available volume based on harvest area; in forest units with a high poplar content (PO1, MW1, MW2) the same comparison yields 66% utilization.
- Pine volumes were underestimated in the present curves for the PJ1, PJ2, and MW1 forest units. Area harvested was 80% of the forecast with 107.8% of the volume realized.
- Spruce volumes were over estimated. Across all hectares in the FMP the average volume of spruce forecasted was 68.2 m3/ha. Based on the actual harvest (all hectares) the spruce volume was 61.7 m3/ha. The overestimate would be more pronounced on conifer dominated forest units such as SBC, and less so on other forest units such as PJ1/PJ2.

These yield curves were carried forward into the 2008-2010 contingency plan. As part of the development of the 2010 FMP more extensive efforts have been made to make the yield curves more reflective of actual conditions encountered, and account for variance between operating areas and ecological differences.

Natural Succession

The natural succession assumptions used in the 2003-2008 FMP were largely based on the "Northeast Region Proposed Succession Pathways SFMM Rules for the standard Forest Units (in the absence of fire)" (February 16, 2001)" technical report. The OMNR technical report represented the best available information of the day. Minor refinements were made to some of the succession pathways by the planning team and MNR Regional Specialists to better reflect local forest conditions. The refinements made to the natural succession assumptions used for the 2003 FMP are described in detail in section 2.3.4.1.3 of the plan text.

Natural succession pathways for the 2010-2020 FMP were developed using a number of sources. These sources included:

- NESI Tech Note TN-020 (Successional Pathways - Proposed SFMM Rules for Northeast Regional Standard Forest Units) (August 2004)
- The 2003 CMRMU FMP, the 2005 SRF FMP, the 2005 IFF FMP, and the 2008 Nighthawk FMP SFMM natural succession pathways

Natural Disturbance Rates (Pre-suppression and Post suppression Fire Cycles)

The 2003-2008 FMP used the pre-suppression and post suppression fire cycles available in SFMM. Other information available that was applicable to the CMRMU landbase was limited. The 2010 FMP used a different approach using stand age to determine the time since fire. Where a stand had a jack pine, white birch or aspen working group, or the stand was a lowland site with greater than 70% stocking the stand age was used as the time since fire. The average stand age was also used where stands contained spruce and aspen as the two leading working groups and were in equal proportion. To account for successional events in mixedwood and SF1 stands 170 years was added to the difference between the stand age minus 60 years. Finally for low stocked lowland sites the stand was assigned a time since fire of 200 years.

The methodology was based on work by Bergeron et al carried out on the Lake Abitibi Model Forest.

Silvicultural Treatment Proportions by Forest Unit Constraints

The silvicultural treatment proportions by forest unit constraints rule set used in the 2003-08 FMP were largely based on the "expert opinion" of planning team members and on their knowledge of past regeneration treatments. In general, the modeling assumptions used in the 2003 FMP were kept very simplistic.

Silvicultural treatment proportions by forest unit constraints were applied in the 2003 FMP to prescribe a relative mix of treatments by intensity for each forest unit to reflect the actual site conditions expected to be encountered and to reflect a realistic mix of treatment intensities based on historic treatment/intensity levels. The maximum limit placed on the LC1 Basic 1 intensity was redundant as the treatment could not exceed 5% due to the 95% minimum extensive treatment already placed on LC1extensive.

The silvicultural treatment proportions limits used in the 2003 FMP are summarized below.

Table 3. Minimum Renewal Limits by Proportion and Intensity used in SFMM for Term1 to Term10

Forest Unit	Extensive	Basic 1	Basic 2	Intensive 1	Intensive 2
LC1	95%				
SBC	60%		20%		
SBH	70%				
PJ1				90%	
PJ2				80%	

Table 4. Maximum Renewal Limits by Proportion and Intensity used in SFMM for Term1 to Term10

Forest Unit	Extensive	Basic 1
LC1		5%
MW1	50%	
MW2	50%	
SBC		5%
SBH		5%
PJ1		5%
PJ2		5%
SF1	20%	5%
SP1		5%

The renewal intensities used in the 2003 FMP are briefly described below:

- **Extensive** Silviculture Intensity – reflects a natural renewal treatment
- **Basic 1** Silviculture Intensity – aerial seeding treatment

- **Basic 2** Silviculture Intensity – in fill planting. May or may not require tending
- **Intensive 1** Silviculture Intensity – higher cost, more aggressive artificial treatment strategy. Would normally include high density planting with a follow up tending.
- **Intensive 2** Silviculture Intensity – Would normally include site preparation, high density planting with a follow up tending.

Although a comparison to the modeled levels and constraints for silviculture renewal intensities to actual treatment levels would normally be informative, the low (43%) harvest level limits the validity of any identified trends. Levels of regeneration treatments forecast in the FMP were based on the Selected Management Alternative output from SFMM.

Area Forecast to Revert To Roads and Landings

For the 2003-2008 FMP loss of productive land to roads and landings as a result of forest operations was assumed to range from 3% to 5% percent of the annual harvest area for each forest unit. This assumption was an attempt to address a data gap in strategic modeling. The loss was modeled to occur for the first 10 terms after which all roads were expected to be in place. The estimates were based on a series of field measurements that measured actual area lost to roads and landings. The actual areas were compared with the harvest areas to produce the percentage conversion. The plot areas were also intersected with the FRI to determine the forest unit in which the plot was located, and if there existed a difference in the conversion factor based on the forest type.

For the 2010-2020 FMP, a more extensive analysis used supplemental aerial photography to measure the area covered by slash. The area lost to slash will vary based on the treatment regime implemented. The more intensive the treatment the less area will be lost to slash. The inverse is also true where there will be more area lost to slash when the site is treated extensively. The area lost to slash was prorated based on the anticipated silviculture program to develop the percentages by forest unit to be used in SFMM. Preliminary results showed that slash would cover between 0.7% and 2.3% depending on the forest unit with an area weighted average of 1.4% the final figure used will depend on the mix of silviculture and number of roads constructed.

The length of time used in the model for area to be lost to roads and landings was too long, and did not consider that the unit would eventually become fully accessed and roads could be used a second time. In future modeling the numbers of terms where area would be lost to roads and landings should be reduced to account for the unit becoming fully roaded.

Growing Stock Volumes Left Unharvested

For the 2003-2008 FMP assumptions were made for the proportions of each species to be left as unharvested volume following harvest operations. This was meant to reflect where un-merchantable or un-utilized tree species would be left on site. The 2003 FMP made two assumptions with regard to un-harvested volume. The first was that poplar volumes associated within the LC1 and SBH forest units would be incidental and as such would be left standing. Poplar found on these sites would not be of significant enough volume to warrant harvest, processing, and hauling. The second assumption was 5% of black spruce volume found on lowland sites (LC1, SBC, and SBH) would be left on site through careful logging techniques. The 2003 FMP also did not account for the volume left unharvested as residual snag trees, but the 25 tree per hectare requirements were clearly indicated in the silvicultural ground rules. Direction from Regional MNR staff was that NDPEG requirements would not be modeled for strategically in 2003 FMP's but would be implemented in the operational portion of the plan.

For the 2010-2020 FMP, assumptions were made for the proportions of each species volume expected to be left unharvested to meet NDPEG residual snag tree requirements (i.e. 25 trees per hectare) and to account for the seed trees left unharvested for cedar renewal. To account for the cedar seed trees left on site for renewal purposes (approximately half of the cedar trees) cedar volume in every forest unit was identified as being left unharvested in the model. Since this proportion exceeded the NDPEG proportions, the amount entered into SFMM for cedar was 50%.

The percentage of the merchantable volume that will be left unharvested to meet NDPEG requirements was calculated as follows:

1. It was assumed that half of the required number of residual trees per hectare will be living trees.
2. 12.5 trees per hectare were selected by species based on the forest unit species composition.
3. Estimates were made for the trees that would likely remain as residual trees.
4. The volume retained was then calculated by multiplying the number of trees retained by the average volume of each tree.
5. The percentage of volume retained (by forest unit and species) was then calculated by dividing the volume per hectare retained by the total volume per hectare of the forest unit.
6. The total net merchantable volume per hectare is the volume by species at the peak of the yield curve.

The 2010 contingency forest management plan for the amalgamated Abitibi River Forest reviewed and modified assumptions in the modelling for the development of the LTMD (see Section 3.0, pg 2). The review included an analysis of the existing Forest Units and the subsequent development of updated forest units. The data presented in this trend analysis does not provide any evidence that the new forest units are inappropriate or warrant modification. An issue that is not uncommon on forests is the continuous modification and refinement of forest units. This trend has made the comparison between planning periods difficult and often negates the opportunity for the forest manager to extract trends from the data. With the amalgamation of four former management units into on forest, with the application of one set of forest units across a larger area, the issue of forest unit comparisons between planning periods should lessen.

Table AR-13a and b has shown some preliminary indications that the actual achievement of the projected forest unit through the application of a specific silvicultural ground rule and modeled via the post renewal forest succession inputs requires refinement. Although the total area regenerated by Forest Unit is acceptable, the future forest units being created by the treatments do not appear to be meeting projected levels. Refinements to the SGR projections were made for the 2010 contingency plan however, for the development of the 2012 FMP it is recommended that all current silvicultural effectiveness monitoring data be re-analyzed to ensure that future forest unit projections reflect the survey data.

4.5 Assessment of Objective Achievement

Table AR-14 provides an assessment of objective achievement as described in the 2008-2010 contingency FMP. All quantifiable objectives and indicators of sustainability and non-quantifiable objectives were assessed as sustainable at the start of the planning period. The 2008 objectives effectively mirrored those from the 2003-2008 FMP as the strategic direction from this plan was carried forward to the contingency plan. With one year of implementation data available there is no meaningful operational information yet to measure the success of the contingency plan objectives. The 2003-2008 yr-10 annual report provided a complete review of the plan objectives as follows.

Management Objectives for the 2003-2008 were included in four broad categories.

- **Forest diversity**
- **Social and economic matters, including timber harvest levels**
- **The provision of forest cover for those values which are dependent on forest cover**
- **Silviculture.**

Other sources that influenced the creation of objectives for the 2003-2008 FMP are the Policy Framework for Sustainable Forests(PFSF) and the Canadian Council of Forest Ministers. The following discussion lists the four broad objectives as headings. The numbered sentence is the objective and the bullet points are the targets. Then a brief comment is made on how and whether the target was reached.

4.5.1 Conservation of Biological Diversity

1) Ensure that current biological diversity of the forest is not significantly changed and where necessary and practical, is restored.

    - Maintain all major boreal forest types that are currently found on the Cochrane-Moose River Management Unit
    - Move toward a balanced age-class structure by area while maintaining 15% in or above mature age classes and a minimum of 5% in over-mature age classes
    - Area in each forest unit cannot change by more than 2% per year over the 5-year planning period. This would represent a maximum change of 20% between terms. The total change in the representation of a forest unit cannot change by more than 50% over the long term (100 years). Exceptions to this strategy would be made for rare forest units where the initial areas are quite small.
    - Implement targets to maintain the forest in mature (15%) and over-mature (5%) age classes. These targets can only be assessed after the first term as the current age class structure cannot be changed to meet first term targets.

The strategic forest management model was used to determine levels of harvest and renewal by forest unit to ensure that all forest units (Crown Managed Forest) were sustained within +/- 50% of the levels described in table FMP-3 (2003 – 2008 FMP). AR-14 shows that this target was met.

The planned harvest areas attempted to match closely the target areas by forest unit and age class to ensure that levels of old growth (15% mature, 5% over-mature) were being maintained. Although some substitution occurred within both younger and older age classes, the areas selected for operations achieved the desired targets.

Limits were placed on each forest unit so as to limit the change in forest unit area. These limits were placed using the strategic forest management model and therefore the selected management scenario inherently held to this objective. This objective was met.

2) Maintain preferred/marginal habitat for the featured regional species within the bounds of natural variation as portrayed in the results of the Strategic Forest Management Model

    - Maintain preferred/marginal habitat for the regionally featured indicator species within +- 20% of the natural range as determined by the Strategic Forest

Management Model.

Constraints were set in the Strategic Forest Management Model (SFMM) to maintain the area of preferred/marginal habitat for each wildlife species within 20% of the natural range as determined by the SFMM model and the trend established by the Null Run. An assessment of the levels of preferred/marginal wildlife habitat was completed based on the planned harvest area by forest unit and age class area selected for harvest operations. This assessment determined that the levels of preferred/marginal habitat were maintained within 20% of the natural range.

The silviculture ground rules (SGR's) that have been developed and which will be followed during the contingency plan will ensure that a range of habitat conditions is maintained.

Area selected for harvest operations have been planned in a manner that emulates natural disturbance patterns both in terms of size and configuration. Residual patches within harvest blocks have been selected with input from the MNR's Area Biologist taking into consideration wildlife habitat requirements (i.e. moose shelter patches).

Site-specific forest management guideline requirements for providing habitat (i.e. moose aquatics) for featured species have been applied during the planning of areas selected for operations based on site conditions. This objective was met.

3) Ensure that harvesting practices do not reduce the long-term levels of Caribou habitat found on the Moose River Sub-unit

   Maintain habitat on the unit that is suitable for supporting caribou.

During the development of the 2003-2008 FMP specific areas of concern were developed and implemented to protect both caribou calving areas and caribou winter use areas. Operational practices such as an enhanced approach to careful logging around advanced growth were implemented and are leaving more structure after harvest so that caribou feel less exposed.

Recently, Tembec has spearheaded the development of a landscape level approach to the protection of caribou habitat and range. This approach includes a strategy for deferring harvest in over 1,000,000 hectares of boreal forest, in order to ensure logging practices does not negatively impact the use of the forest by caribou. The Moose River subunit of the CMRMU is the keystone to the caribou strategy. Tembec vetted its caribou strategy through MNR wildlife and policy specialists as well as partnering with environmental groups such as the Wildlands League and World Wildlife Federation. This objective was met.

4) To provide suitable marten habitat on the Cochrane-Moose River Management Unit

Maintain 10-20% of the forest that is capable of producing marten habitat in suitable conditions arranged in core areas between 30 and 50 square kilometres, with a minimum of 75 percent of the area in suitable conditions.

Constraints were set in the Strategic Forest Management Model (SFMM) to maintain as a non-spatial target, 56,557 hectares of preferred marten habitat within the Cochrane-Moose River Management Unit as a whole for a period of 60 years. An assessment of the levels of preferred marten habitat area was completed based on the planned harvest area by forest unit and age class area selected for harvest operations. This assessment determined that the 56,557 hectares of preferred habitat could be maintained over the 60-year period.

Eight marten core areas were established across the Cochrane-Moose River Management Unit providing a good distribution of marten core area across the landscape. The ten marten core areas encompass a total area of "suitable" habitat of 56,557 hectares or 10.2% of the total suitable area on the forest. There ratio of suitable marten habitat in cores to the available suitable area on the forest is predicted to increase to 11.7 percent within 60 years. The core sizes range between 1,067 and 47,206 hectares.

During the implementation of harvest operations, 25 dead or declining trees per hectare with a least 6 larger diameter live trees will be retained standing in harvest blocks. Retention of these snag trees will ensure that existing and future wildlife cavity trees exist on site and that sources of coarse woody debris beneficial to marten are maintained on site. Tembec will continue to regularly monitor through its compliance program that adequate levels of snags are being maintained. As required, harvest operators will receive snag retention training.

The structure, age and spatial arrangement of suitable marten habitat on the CMRMU meant that while the minimum 10.2% capable area as suitable area within marten cores was met the 75% area in suitable conditions within each core was not met nor will be met as it is a physical impossibility. This objective was partially met.

5) Ensure the genetic diversity of trees on the forest is conserved.

- Maintain a supply of black spruce, white spruce and jack pine seed sufficient for regeneration requirements.

The following table shows the seed inventory for the Forest as of March 2008.

Table 5. Seed Inventory as of March 2008.

Species	Total (million)
Pj	9.616
Sb	258.351
Sw	173.568
La	5.881

There is ample supply of seed at present. Tree seed collection zones have and will continue to be respected and seed inventory records will include the recording of the seed collection zone. The need, if any, for additional seed is that of jack pine in order to support potential aerial seeding projects in the future. This need has been addressed with the collection of approximately 7 hectolitres (seed zone 6) seed during the 2008-2009 season.

Careful logging techniques will continue to be used where appropriate (i.e. lowland black spruce areas) during the contingency plan to protect advanced growth thereby ensuring the local sources of genetic diversity is conserved. For the 2006 period there has been a total of 6,169 ha carefully logged. This objective was met.

4.5.2 Maintenance and Enhancement of Forest Ecosystem Condition and Productivity

1) Provide for the long-term health and vigour of Crown forests by using forest practices that, within the limits of silvicultural requirements, emulate natural disturbance patterns and landscape patterns

- Provide a range of disturbance patch sizes to move toward a more natural condition as described in the FMGENDAR report.
- Provide residual structure to move towards a more natural condition as described in the Natural Disturbance Pattern Emulation Guidelines.

Some disturbance size classes are moving toward the template while others are not during the 2003-2008 term. As a result of many harvest allocations not being operated, the relative distribution of disturbances is influenced to a greater degree by past harvest. A range of disturbance patch sizes have been provided.

Insular and peninsular residual areas were planned and laid out in the field according to the exact percentages by forest type in Table 1 of the Natural Pattern Emulation Guide (NDPEG). The recommended percents in the NDPEG table 1 were treated as minimums for each planned harvest disturbance in the 2003-2008 FMP and therefore the Cochrane-Moose River Management Unit has exceeded at the disturbance and at the forest level the amount of residual left following harvest. This objective is deemed partially met.

2) Develop and implement a roadside slash reduction program for the Cochrane-Moose River Management Unit

    - Reduce the area lost to roadside slash after a harvesting operation.

Prior to the implementation of the 2003-2008 FMP management of logging residue had fallen out of favour and was not being consistently carried out as a forestry practice in Northeastern Ontario. During and after harvest operations in the 2003-2008 FMP, productive upland conifer and mixed wood sites were often piled with some burning of these piles afterward. 181 hectares of forest area were reclaimed via slash burning and 830 hectares reclaimed through slash piling activities during the 2003-2008 period. Recently an interest in using some of this material for biofibre has arisen making its removal from the site economic. This objective has been met.

3) Keep forest ecosystems productive

    - Survey NSR and barren and scattered land on the unit over the planning period and make recommendations for treatment. The survey will also include B&S land on the Cochrane sub-unit.
    - Zero environmental infractions during the term of the plan.

The amount of NSR land on the unit as of March 31, 2008 was 9,616 ha or 0.9% of the Crown managed forest area. A concerted survey program was carried out during the term of the2003 FMP. A total of 21,800 ha was surveyed and reclassified and included identifying additional NSR area. At the beginning of the 2003-2008 FMP there existed 10,006 ha of NSR lands. Since 1993, a total of 48,296 ha were harvested.

A few small trespasses occurred which did not affect forest productivity or cause any environmental concerns. Harvesting occurred in the winter so little damage was done to the creek and sections of the creek where subsurface. This objective has been partially met.

4) Maintain the productivity of stands treated with careful logging and HARP techniques

    - Develop a greater understanding of second growth stands that result from the implementation of careful logging and HARP.

During the initial years of the 2003-2008 FMP detailed careful logging assessments were continued. These assessments defined where acceptable and deficient seedbed existed to enable regeneration from advance growth and seed of black spruce. However in the last two years of the FMP these assessments were discontinued. Lower harvest levels meant that there were fewer sites to check and have meant that staffing is an issue. In place of detailed careful logging assessments post harvest assessments are conducted by the Operations Coordinator and the documentation on file includes estimates of anticipated natural regeneration and/or treatments required with timelines. Although survey and assessment data has been collected no in-depth study has been conducted to define what pre-harvest condition coupled with harvest method/equipment best provides for natural regeneration via careful logging or HARP. This objective has been partially met.

4.5.3 Conservation of Soil and Water Resources

1) Minimize the impacts on water quality and aquatic habitat within areas of harvest operations.

- Work towards continual improvement in operations near aquatic environments
- Zero infractions on water crossing installations.
- Zero infractions on water reserves.

Knowing that operations around streams and lakes can cause the most environmental impact, the company makes it a point that all contractors are aware of the potential risks when working close to water. Line runners are instructed to mark off riparian areas as encountered. Many riparian areas do not show up on the maps. The instructions are to apply a riparian reserve (i.e. 3 m) to any defined channel with or without water and map them. This is the first “line of defense”. Since not all areas can be identified at the time of line running, the road locaters are the secondary “line of defense”. If they run across a stream or riparian area, Tembec is contacted and appropriate AOC’s are applied. Several new streams and riparian areas have been identified and protected in the 2003-2008 period. Riparian areas were identified in many blocks by the line runners and protected.

There was one non-compliance in 2007 with water crossing 306 which was approved for a culvert or equipment only bridge, however a temporary portable bridge was installed by Tembec instead, this procedural errors did not affect soil or water resources in any way. During the 2006 year there were 2 non-compliances involving water reserves by independent licensees on the Cochrane subunit and in the 2003 year there was 1 incursion into a waterway reserve. These 3 occurrences, although none led to any adverse affect on the associated water body, demonstrate the importance of continued training of harvest operations and other personal involved in field operations. This objective has been partially met.

4.5.4 Forest Ecosystems Contributions to Global Ecological Cycles

1. Ensure that the available forest is protected from sustained deforestation or conversion to other uses.

    - Maximize the Total Crown Productive forest

Maximization of productive forest was considered during selection of the management alternative for implementation in the FMP. The silvicultural program was maintained and the targets were reached or exceeded in most cases even though only 44% of the allowable harvest area was cut. Actual silvicultural spending was 119% of forecast expenditures.

There was an increase in productive Crown forest of approximately 10,300 ha or 1.25% at the start of the 2003-08 FMP. The 1.5% increase resulted from improving the quality of the forest resources inventory at plan start. The largest contributor to this increase was reducing the buffering of low order streams from 10 to 4 metres. The activity that has the largest potential to reduce the Crown productive forest is road construction and associated aggregate extraction. During the term of the 2003 FMP, 31 kilometres of primary road were constructed. Assuming a 40 metre average right of way for primary road, this loss of productive forest equates to reduction of 124 hectares or less than 0.02% over the five year period. This objective was met.

4.5.5 Multiple Benefits to Society

1) Supply industrial and consumer wood needs while maintaining forest sustainability, (CFSA, PFSF) and to realize a predictable, continuous, and consistent flow of roundwood from the Cochrane-Moose River Management Unit

    - Allocate sufficient area from the unit to harvest an annual SPF volume of 330,000 m^3.
    - Allocate sufficient area from the unit to harvest an annual OSB poplar volume of 54,635 m^3.
    - Allocate sufficient area from the unit to harvest an annual poplar veneer volume of 9,000 m^3.

Use of the SFMM predicted that the 355,547 m^3 of SPF were available with current constraints on wood supply including marten core areas and landbase reductions imposed through the OLL initiative. Poplar volumes were predicted as 59,318 m^3 of OSB and 10,468 m^3 of veneer. Harvest allocations were selected within the term of the FMP that were accessible and which were modestly younger than the selected management alternative chose, particularly in the PJ1 and PJ2 forest units. These selected allocations provided an estimated 355,348 m^3 per year SPF, and 62,787 m^3 of poplar. The forecast harvest area as approved in the FMP was not harvested in its entirety supplying a total SPF volume of 154,810 m^3 per year.

Poplar volume achievement was affected by aspen decline. Deliveries of aspen averaged 25,799 m^3 of which 9,170 m^3 was veneer.

Harvest area was not maximized. Of a planned harvest area of 22,240 hectares, 44% was harvested. This under harvest weakened the level of achievement of volume targets. Future FMP assumptions should include an estimate of the effect of aspen decline within the modeling to accurately portray the associated volume loss and allow the SFMM to attempt to achieve the committed poplar volume. The selection of harvest area should closely approach the 'recipe' suggested by the SFMM with regard to conifer allocations in order to more closely supply the needed volume to local mills. This objective was met.

2) Enhance the fur bearer habitat on the unit.

   - Creation of new areas of browse species for fur bearing animals such as beaver.

The 2003-2008 FMP contained a prescription that would permit partial renewal, (through harvesting), of selected shorelines. Unfortunately, implementation of this prescription encountered an assortment of policy roadblocks and a general unwillingness to implement the District and Company operations level.

Following renewal, several aerial spray operations adjacent to riparian areas where harvest occurred within three metres of riparian areas, (gullies and intermittent creeks), had 60 metre spray buffers applied. This offset of maintenance activities encourages the growth of hardwood and shrub species and makes these areas more attractive to beaver. This objective was met.

3) Ensure the protection of other values on the land base

   - Zero loss of traps or nesting boxes as a result of forest operations.
   - Zero infractions on protected areas.
   - Zero loss or disturbance of identified nesting sites.

Operators are told that when they see trapper's boxes to cut the tree above the box or leave it as a snag tree. No traps were lost during the 5 year term. When speaking to trappers, often they say they have not been contacted that operations are occurring on their trap line. It is the MNR's responsibility to contact stake holders. Because of freedom of information this information is rarely to the Company. The MNR provides notification to all affected stakeholders, including trappers; however the numbers of affected individuals, greater than 300, means that the information in these notifications is rather general. Although each notification encourages individuals to contact the MNR for specifics many do not take this step; this is likely related to there being no record of complaints for non-notification at the District. Ad-hoc discussions with affected trappers who say they have not been contacted highlight the potential to do more for these affected individuals, for example, holding annual meeting with the fur council or working with the council to personally contact affected trappers in advance of annual operations. There was no loss of traps or nesting boxes reported during the term of the FMP.

There were no infractions on the 8 Ontario Living Legacy protected areas and there where no instances of loss or disturbance to known stick nests. This objective was met.

4.5.6 Accepting Society's Responsibility for Sustainable Development

1) Relationship building with First Nation communities

    - Increase the awareness of First Nation communities as it relates to forest management planning harvesting, and silvicultural activities.

Opportunities for a consultation approach to be developed by the individual Aboriginal community were offered to the Aboriginal communities involved in the development of the 2003-2008 FMP. It is hoped that this approach has encouraged greater participation of the communities in the planning process.

The planning team attempted to hold open, honest and meaningful dialogue with First Nations communities involved in the development of the Cochrane-Moose River Management Unit Contingency Forest Management Plan (CFMP). Unfortunately First Nation involvement in the 2008-2010 CFMP was limited – Wahgoshig FN participated but Moose Cree FN refused and Taykwa Tagamou Nation's participation was limited. This was potentially caused by limited First Nation staffing resources and pressing interests in other areas, (i.e. mining). Tembec and MNR will continue to encourage the participation of First Nation communities in forest operations (i.e. planning, harvesting and silviculture).

Through their economic development entities two First Nations continued to harvest and build roads on the Moose River MU, although work was limited by mill curtailments. This objective was partially met.

2) Insure the appropriate protection of non-timber values identified on the landbase

    - Maintain an up to date Natural Resources Values Information System

(NRVIS) database.

MNR updated values information during the implementation of the 2003-2008 FMP. Cochrane District MNR routinely provides updates of new and obsolete values through their geographic information officers. In preparation for the contingency management plan in 2008 an up to date package of all known values on the Cochrane Moose River Management Unit was provided to the Planning Team.

Tembec updated AOC prescriptions based on the most current guidelines/policy direction (i.e. osprey guide) in the development of the contingency plan. Tembec followed the requirements of the Approved Cochrane Remote Wilderness Strategy.

Tembec's environmental certification processes require the development of systems and procedures aimed at continuous improvement of its environmental management performance. These systems include an adaptive learning process for Tembec's staff and contractors to improve Tembec's operations. Evolution of Tembec's environmental management systems will continue during the implementation of the contingency plan. Tembec normally organizes a training week each spring for its contractors and staff; included in this training is a seminar on nest identification and species at risk legislation and also on Cultural Heritage Values. Spring training was not provided in 2008, due to limited operations levels, but was provided in each of the four previous years. This objective was met.

3) Conduct forestry practices in a manner such that all resource users may gain benefit from the forest, while recognizing that compromises need to be made to ensure the viability of resource based activities.

   - To minimize any negative impacts that forest management activities may have on other forest users and uses.
   - Over the 20-year planning period no more than 50% of the critical trapping habitat found on any one particular trapline will be harvested. Critical habitat is defined as 100m from permanent creeks and lake shorelines.

As part of the allocation process for the 2003-2008 FMP the disturbance levels on individual traplines were reviewed. Where the impact level may have gone above the target of 50% of critical trapping habitat affected allocations were modified. Furthermore, as a result of curtailed harvest levels in the 2003-2008 period effects on traplines were mitigated further.

Beginning in 2007 Tembec deferred operations in the interim caribou deferral zones as agreed upon with MNR. This caribou deferral has been developed with the input of environmental groups, MNR staff and scientists, and company operations staff.

The full participation of the planning team was sought during the development of the contingency plan to ensure all forest values were considered. Hardwood users and Cochrane independent operators were involved in the planning of harvest allocations. The planning team will continue to involve and encourage the participation of Aboriginal communities and the Cochrane LCC to improve management decisions affecting the Cochrane-Moose River Management Unit. Important decisions affecting the contingency plan were reached via consensus-building methods. This objective was met.

4) Ensure that appropriate updates have been made to the planning inventory.

   - Reduce the area in the planning inventory identified as barren and scattered or not sufficiently regenerated.
   - Develop a poplar decline assessment strategy.

The contingency plan has been developed using the most up to date forest resource inventory available. The most current forest management guidelines and policy direction have been followed during the development of the contingency plan. MNR's Science Advisors were consulted as required by the planning team.

A total of 31,608 ha of Free to Grow assessment were completed for the 5 year term or 6,322 ha per year. MNR in addressing the 2005 Independent forest audit has begun to audit the results. The MNR and Company have begun to meet yearly to compare their results. Generally results where similar.

Although several attempts were made to address the poplar decline during the term of the 2003-2008 FMP limited progress was made. Norbord did harvest several areas that were declined and the renewal of these sites is being monitored. The 2010-2020 Cochrane Area Forest does contain a comprehensive strategy for the allocation, harvest and renewal of poplar, (aspen) decline areas. This objective was partially met.

5) To conduct forest management activities on the unit in such a manner that it contributes to Tembec's corporate objective of Forest Stewardship Council certification.

   - Work towards continual improvement in forest management planning and operational practices

The planning team and members of the LCC have worked towards educating the public on forest ecosystems, objectives and management tools during open houses held during the development of the contingency plan. These efforts will continue during the development of the 2010-2020 Forest Management Plan for the Cochrane Area Forest.

In 2004 and in August 2005, two Canadian Teachers Tours were carried out through the support of the FRP to promote learning within our education system. The Company held an Aerial Spray Open House in Timmins and Cochrane in 2005. A booth was manned at the Sportsman Show in Timmins in 2004 and 2005. This objective was met.

4.6 Determination of Sustainability

This section will discuss the assessment of sustainability of the operations and activities conducted on the Forest during the 2003-2008 period and reference the one year of implementation of the 2008 contingency FMP. The assessment of success of the plan in achieving forest sustainability is produced though the examination of measurable indicators of the forest sustainability criteria and an analysis of changes to the forest condition and the socioeconomic condition over time. Forest sustainability must be assessed at the end of the five-year term of the forest management plan. The assessment of success of the plan in achieving forest sustainability is produced though the examination of measurable indicators of the forest sustainability criteria and an analysis of changes to the forest condition and the socioeconomic condition over time. RPFO Tables RPF0-13, 14, 15, 16, 17, 18, and 19 from the 2003-2008 yr-10 annual report are included in addition to the 2009 FMPM requirements and contain the information used in this assessment. These tables are completed over successive five-year terms.

4.6.1 Comparison of projected, actual and desired future forest condition for the managed Crown area available for harvest.

The managed Crown area available for timber production as contained in Table RPFO-13 is one indicator of forest sustainability. Major differences in the desired future forest between one FMP and the next would be illustrated in this table. The current plan is a two-year Contingency plan. Many of the requirements for a normal plan were not required, therefore comparisons to the next Plan cannot be made since much of the information was not required to be rerun. The two-year contingency is a continuation of the past 5-year plan. The Cochrane-Moose River Management Unit is being amalgamated into the Abitibi River Forest for the 2010-2020 Period.

4.6.2 Crown Forest Areas Available for Timber Production

The purpose of Table RPFO-14 is to compare the predicted forest available for timber production to the actual value. The table provides data necessary to help in the evaluation of the sustainability criterion of multiple benefits to society. The actual area for the planning terms, come from the total in Table RPFO-13. The differences in the area available for the planning terms are a result of the factors listed in the previous section. There is no previous information to start making comparisons with. The predicted area at year 20 of the 1998 FMP was estimated to go up because of the aggressive assessment of harvest and natural backlog areas. This is partly borne out by the year 10 predicted level of the 2003-2008 FMP. Unfortunately, the 2008-2010 contingency plan uses the same strategic components and no actual values area available. Thereafter, a declining trend of productive forest area available for timber production is predicted due to the continued loss of area to roads and landings. The loss of productive forest area available for timber production will slow in the future as the forest becomes better accessed and as the amount of new road construction diminishes.

4.6.3 Landscape Patterns or Forest Diversity

Predicted forest/landscape diversity indices, when compared with the actual values, record whether or not the actual indices levels are acceptable at the end of the planning term. Table RPFO-15 provides data to help evaluate an aspect of the forest sustainability criterion of biodiversity. No comparison between the predicted 1998-2003 FMP and the actual from the beginning of the 2003-2008 FMP is robust because, for the 1998-2003 period the Cochrane Crown Management Unit and the Moose River Management unit were separate forests with separate plans and strategic modeling, furthermore the landbases changed between plans with certain outlier portions transferred to the Smooth Rock Falls Forest for contiguous management. However a quick review of the actual numbers provided from the 2003-08 FMP at plan start shows them within the ranges of both the Cochrane Crown Management Unit and the Moose River Management unit acceptable ranges. Therefore the results have met this criterion.

4.6.4 Habitat for Selected Wildlife Species

The purpose of Table RPFO-16 is to compare the amount of preferred habitat for selected wildlife species that the selected (balanced) management alternative predicted would be supplied versus the amounts actually created through implementation of the plan. The 1998-2003 FMP had four selected species: Woodland Caribou, Marten, Moose (foraging), Moose (winter). Although the landbase changed between these plans the actual area at the beginning and at year 10 of the 2003-2008 FMP shows the habitat area available for these four species higher than predicted in 1998. No other comparisons can be made at this time because for the two-year contingency plan new runs were not required. The predicted levels are the same as the actual because of this. There will be changes to the available area for certain species in the 2010-2020 FMP. The forest units and therefore the habitat balance will be different for the 2010-2020 FMP. For example, there is a reduction in the

SB1 forest unit. In the past plans, the SB1 forest unit was made up of low and high ground spruce. The new plan splits high and low ground spruce where SB1 represents low ground spruce only.

4.6.5 Selected Measurable Indicators of Forest Sustainability Criteria

Table RPFO-18 records values for measurable indicators listed over successive plans. The intent of the table is to provide the basis for an evaluation of trends in these indicators through time:

- Forest condition and ecosystem productivity;
- Multiple benefits to society;
- Soil and water conservation; and,
- Accepting society's responsibility for sustainable development

The total productive Crown forest by working group was examined over two successive planning terms beginning with the 1998-2003 term. There was a 1% increase (10,379 ha) from the 1998-2003 and 2003-2008 plan in productive Crown Forest. The transfer of approximately 22,300 ha to the Smooth Rock Falls Forest is accounted for in this comparison. There were slight increases in the pine, black spruce, and other conifer working groups. White birch had the largest reduction in area as a percent (22%) and balsam fire, poplar, and larch also decreased slightly as a result of the transfer to the Smooth Rock Falls Forest due to some concentration of these working groups in the area transferred. The biggest gainers as a percent were white spruce and cedar. Other than black spruce all increases can be attributed to landbase updates as a result of backlog assessments of previously harvested area. The black spruce working group, although increased by updates of backlog areas, was also increased as a result of reducing the buffer width of streams in the forest resource inventory.

The percentage of Available Harvest Area (AHA) actually utilized by forest unit was completed for the 1998-2003 and the 2003-2008 period. It is difficult to compare the two terms because the Forest Units are different. In 1998-2003 a total of 75% of the allowable harvest was cut. A similar level was achieved during the 2003-2008 period with 44% per cent of the harvest area producing 46% of the conifer, 39% of the poplar, and 9% of the Birch forecasted volume. The trend in both FMP's is that conifer volume supply is well estimated in the FMP and poplar is less well estimated. Birch has been typically underutilized and the available volume has traditionally been left standing in harvest areas. The decrease in poplar volume achievement term over term may be an affect of volume loss due to mortality. This mortality is associated with aspen decline in the Cochrane area as most of the poplar harvest occurs in and around this concentrated area of decline mortality. Volume estimates for aspen decline areas are being addressed in the development of the 2010-2020 FMP for the Cochrane Area Forest.

Ratio of area of riparian reserve to length of shoreline adjacent to harvest activity is 8.23 ha/km for the 2003-2008 term. This is the only number available so no comparative assessment is possible. The Forest value indicates that on average, AOCs and block design kept harvest operations at least 82.3 metres from riparian areas. This value has no actual relationship to the amount of harvest or the number of creeks harvested along.

The number of native communities adjacent to the Forest, which were involved in the special Native consultation process, was 66% or 2 of 3.

Even though the allowable harvest area was not achieved, the silviculture dollars spent were close to or above the estimate from the FMP. With only 44% of the area harvested, spending was at 86% of the planned dollars in 2003-2008. A larger proportion of high ground was harvested than low ground. High ground is where more intensive silviculture takes place. Lower ground and hardwood blocks are generally left for natural. The number of trees planted was 8.745 million versus 10 million planned or 87% of planned number. With only 44% of the area harvested and a relative 198% of the planned area was planted (105% absolute), this ensures sustainability. For the 1998-2003 term, 59% of the planned silviculture dollars and 69% of the allowable harvest was cut. The 2003-2008 term therefore demonstrates the Tembec commitment to effective renewal of the resource which we are stewards of.

The Socio-Economic Impact Analysis (SIEM) was run on the actual volumes harvested and actual silvicultural investments during the 2003-2008 term. The total value added as a result of those forest management activities, according to that model, was $100.05 million dollars or $ 105 per cubic metre harvested.

The LCC is an integral part of the Forest Management Planning process. An opportunity has been provided to LCC members to evaluate their effectiveness in the development of the current plan (2008-10 CMRMU CFMP), and evaluate of the support provided by the MNR. During the November 2009 monthly meeting, the Cochrane LCC were provided a standard evaluation form and asked to complete it. While the total number of respondents was low (five), an average score has been calculated for each question and an overall score included in Table RPFO-18. It is hoped that over the course of several FMP's, LCC effectiveness will be determined to increase as evaluated by the LCC themselves.

The scope of the questionnaire was the 2003-08 period for the CMRMU FMP and 2008-10 for the CMRMU Contingency Plan. It should be pointed out that the that reformation of the LCC in 2006 means that most members are new to the LCC and were not involved with the development of the 2003-08 FMP. However, current LCC member input was valuable in the implementation of the last two years of the FMP (2006-08) and the development of the 2008-10 contingency FMP.

The following is the list of self evaluation questions provided to the LCC and the average response (out of 10) for each question:

Questions and Average Self Evaluation of LCC

Rating 1(Low) to 10(High)

1.	Was the LCC effectively utilised in the issue resolution process as early as possible in the planning process?	6.2
2.	Did the LCC play an effective role with respect to plan amendments including: advising on classification and advising on appropriate consultation?	8.8
3.	Was the LCC effective in providing advice to the MNR District Manager when discretionary decisions were made (e.g. issue resolution, responses to "bump-up" requests, and categorization of amendments)?	8.4
4.	If a contingency plan was prepared, was the LCC effectively consulted with respect to design and implementation of the required public consultation as described in the contingency plan proposal?	7.4
5.	If an insect pest management program was considered, did an LCC member effectively participate in the district or regional pest management committee?	n/a
6.	Did the LCC prepare comprehensive reports of its activities at various stages during plan preparation as defined by the *FMPM* and a brief statement of general agreement or disagreement with the plan?	8
7.	Did the LCC effectively participate in the implementation of the five-stage public consultation process and were they consulted with respect to the need for additional formal public consultation opportunities that would be useful, in the context of local circumstances and needs?	7.8
8.	Did the LCC receive the necessary office support from the MNR to effectively fulfill their duties?	9.4
9.	Did the LCC effectively participate in the implementation of the five-stage public consultation process and were they consulted with respect to the need for additional forums?	8.8
10.	Were all members of the LCC identified at public information centres and was a means of future contact provided?	8.6
11.	Did the LCC provide input with respect to the appropriate forum for public review of the draft FMP?	8

12. Were members of the public afforded the opportunity to arrange meetings with representatives of the LCC at any time during the planning process and were these meetings effective at communicating concerns to the planning team and the district manager through the LCC and resolving issues?	6.6
13. Did the LCC effectively promote integration of all interests by participating in evaluation of tradeoffs to be made during the planning process?	6
14. Was the LCC effectively utilised in the issue resolution process as early as possible in the planning process?	6.2
15. Did the LCC play an effective role with respect to plan amendments including: advising on classification and advising on appropriate consultation?	8.8
16. Was the LCC effective in providing advice to the MNR District Manager when discretionary decisions were made (e.g. issue resolution, responses to "bump-up" requests, and categorization of amendments)?	8.4
17. If a contingency plan was prepared, was the LCC effectively consulted with respect to design and implementation of the required public consultation as described in the contingency plan proposal?	7.4
18. If an insect pest management program was considered, did an LCC member effectively participate in the district or regional pest management committee?	n/a
19. Did the LCC prepare comprehensive reports of its activities at various stages during plan preparation as defined by the *FMPM* and a brief statement of general agreement or disagreement with the plan?	8
20. Did the LCC effectively participate in the implementation of the five-stage public consultation process and were they consulted with respect to the need for additional formal public consultation opportunities that would be useful, in the context of local circumstances and needs?	7.8
21. Did the LCC receive the necessary office support from the MNR to effectively fulfil their duties?	9.4
Total Score:	**7.6**

General conclusions which may be drawn from these survey results (Figure 5) are:

1) Weaknesses – lower scores were found for those questions dealing with LCC participation in the identification and analysis of management alternatives (#7), the communication afforded to members of the public (#12), as well as ability to plan

for these various interests (#13).

2) Strengths – the generally higher scores were found to deal with the communication between the planning team, MNR and the LCC. There appears to be a level of satisfaction with the consultation of the LCC during the plan information centers (#9, 10), through the FMP review and amendment process (#10, 15, 16), and support from the MNR in fulfilling their duties (#21).

Overall, the feedback for the Cochrane LCC was positive, with some areas for improvement. These results will be provided to the LCC and 2010 Cochrane Area Forest Planning Team for consideration through development of the amalgamated Cochrane Area Forest 2010-2020 FMP.

4.6.6 Social and Economic Review

(Text included as supplied by MNR Cochrane District):

Among the analysis components of a Forest Management Plan is evaluation of the selected management alternative's impact on economic, social, and environmental indicators. Based on projected harvest levels, wood flow to specified destinations, and silviculture expenditures, an analysis was completed for the 2003-08 CMRMU FMP (Appendix 7) using OMNR's Socio Economic Impact Model (SEIM). In addition, information was gathered from the 1996 Statistics Canada Census data and a demographic profile was completed for Cochrane, Kirkland Lake, and Timmins District, illustrating the relationship between those communities and forecasted wood flow from the CMRMU.

As is the intention of the Year 10 Annual Report, it is necessary to evaluate the achievements of the 5 year term. Using actual harvest levels, wood flow, silviculture expenditures, and updated price inputs, SEIM was run in November 2008 by Cochrane District MNR. The following analysis has been divided into three main focus areas; economic, social, and environmental indicators. In addition, the most up to date Statistics Canada information (2006) has been compared to the 2003-08 FMP Demographic profile.

Demographic Profile

With the exception of an increase in Cochrane's population, a reduced population base is the general theme when comparing the 1996 census data to the most recent Statistics Canada figures (2006). Overall, those communities receiving benefits from the Cochrane-Moose River Management Unit have seen a 10% population decline over the 10 year period:

Table 6. Population Change in CMRMU Dependent Communities, 1996-2006

Community	1996 Population	2006 Population	% Change
Cochrane	4443	5487	+23
Iroquois Falls	5714	4729	-17
Timmins	47499	42997	-9
Smooth Rock Falls	1982	1473	-26
Kirkland Lake	9905	8248	-17
Total	**69543**	**62934**	**-10**

The largest relative decrease in population (26%) was seen in Smooth Rock Falls, due in part to reduced production and eventual permanent closure of its primary employer, the Tembec pulp mill, in 2006.

Drawing on the key indicators included in the 2003-08 CMRMU FMP Demographic Profile, a comparison of with the 2006 census data for communities of Cochrane and Iroquois Falls is found below.

Table 7. Comparison of the 2003-08 and 2008-10 FMP Demographic Profiles

Indicator	2003-08 FMP*	2008-10 FMP**	Difference
Total Population	10,157	10,216	+59
Avg. Individual Income ($)	27,430	25,449	-1981
Avg. Household Income ($)	48,926	52,223	+3297
Avg. Dwelling Value ($)	89,746	96,592	+6846
Unemployment Rate (%)	10	7.3	-2.7
% Employed in Forest Industry	25.8	unknown	
% of Labour Force by Occupation (Top 10 Leading Categories)			
Manufacturing	23	19	-4
Retail	12	12	---
Health	10	12	+2
Hospitality	8	Grouped with "other"	---
Government	8	Grouped with "other"	---
Education	7	8	+1
Other	5	20	+15
Transportation	5	Grouped with "other"	---
Construction	5	5	---
Logging	3	8	+5

* 1996 Stats Canada Census Data. ** 2006 Stats Canada Census Data.

Among the noteworthy changes is that the population of Cochrane District (Cochrane and Iroquois Falls) has remained on par with 1996 numbers; Iroquois Fall's population has declined by roughly 1000 individuals, offset by equal growth in the town of Cochrane. Individual incomes and housing prices have increased over the past 10 years and unemployment rates have dropped from 10% to 7.3%, a trend seen across the country as a whole. The percentage of the population employed in the manufacturing sector has decreased from 23% in 1996 to 19% in 2006. The relative proportion of the labour force employed in the health profession and education field has increased, as have those identifying "logging" as primary occupation.

SEIM Analysis - Economic Findings

Given the actual harvest levels, silviculture expenditures and commodity prices during the 2003-08 period a comparison to the forecast economic impacts within NE Region is provided below. Information from the 2003-2008 yr-10 AR-5, AR-11, and the November 2008 Commodity Prices and Conversion Factors were used to re-run the Socio-Economic Impact Model.

Table 8. Economic Impact in the Northeast Region

		FMP Selected Alternative[1]	2008 Analysis[2]	% Variation
		(annual figures expressed in thousands of dollars unless otherwise specified)		
Sales	**Direct**	54,335	31,712	-42
	Indirect & Induced	2,129	12,222	**474**
	Total	56,464	43,934	-22
Value Added	**Direct**	22,059	8,894	-60
	Indirect & Induced	4,305	11,116	**158**
	Total	26,364	20,010	-24
Wages & Salaries	**Direct**	16,562	5,755	-65
	Indirect & Induced	1,034	6,755	**553**
	Total	17,596	12,511	-29
Employment, pys	**Direct**	325	104	-68
	Indirect & Induced	171	169	-1
	Total	496	273	-45
Taxes	**Local**	1,376	568	-59
	Provincial	3,082	2,741	-11
	Federal	4,966	4,147	-16
	Total	9,424	7,457	-21

Notes: 1 - source of information is Table 5, Appendix 7, 2003-08 CMRMU FMP
2 - source of information is SEIM 2000 using 2007-08 AR-5 volumes, AR-11 expenditures, and November 2008 Prices and Conversion Factors

In keeping with the harvest of 46% of forecast volumes (0.9 million m3 actual vs. 2.06 million m3 forecast), direct sales were down by a margin of 42%. SEIM estimates an increase in the quantity of indirect and induced sales over the FMP forecast, bringing total annual sales to just over $43 million. Reduced sales meant corresponding declines in employment person years (-45%), contribution of the industry to wages and salaries (-29%), as well as taxes (-21%) compared with forecast values. The total value added as a result of those forest management activities was roughly $100,050,000 over the 5 year term, equating to $105/m3 harvested.

Due to a number of factors, including low commodity prices, energy costs, and trade tariffs, a number of the northeastern region mills were negatively impacted during the period of the 2003-08 CMRMU FMP, resulting in the shift off of traditional markets:

Grant Forest Products – Timmins (167 employees) – idled since 2006
Tembec Industries Inc. – Timmins (168 employees) – idled since 2006
Tembec Industries Inc. – Smooth Rock Falls – closed permanently in 2006

Tembec Industries Inc. – Cochrane – periodic down time
Norbord Industries Inc. – Cochrane – reduced production levels

Market availability meant that wood was merchandized to alternate destinations. The 2003-08 period saw small volumes being sold to out of province markets, for example poplar OSB to Norbord Lasarre, pine sawlogs to Scierie Landrienne and Tashereau, and chips to Temiskaming. In an effort to reduce delivered wood costs, Grant Forest Products purchased less than 50% of expected hardwood volumes off of the CMRMU, choosing to concentrate on fibre supply closer to their Englehart facility. Impacts were also seen in the veneer market, with Norbord Cochrane deliveries off of the CMRMU down by 50% as well.

Table 9. Comparison of roundwood flow from the Cochrane-Moose River Management Unit - 2003-08 FMP SEIM Analysis vs. 2008 AR-5 Volumes

Species Type	Company	Mill Type	Mill Location	Forecast Volume (m^3)	Actual Volume (m^3)	Relative Proportion of Wood Flow	
				SEIM 2003-08 FMP	2003-08 AR	SEIM 2003-08 FMP	2003-08 AR
Conifer Spruce, Pine & Fir	Tembec Ind. Inc	Sawmill	Cochrane	1,469,775	514,875	85.1%	65.8%
	Tembec Ind. Inc	Sawmill	Timmins	176,166	15,629	10.2%	2.0%
	Abitibi-Consolidated	Pulp and Paper	Iroquois Falls	75,993	72,419	4.4%	9.3%
	Other			5,181	179,576	0.3%	22.9%
Hardwood (Poplar & Birch)	Grant Forest Products	OSB	Englehart	257,368	111,008	72.0%	65.8%
	Grant Forest Products	OSB	Timmins	50,401	6,617	14.1%	3.9%
	Norbord Ind.	Plywood/ Veneer	Cochrane	49,686	22,940	13.9%	13.6%
	Other			0	28,258	0.0%	16.7%
			Total	**2,084,571**	**951,322**		

Silviculture expenditures for the 5 year term averaged $720,400 per year, in comparison with a forecasted annual rate of $833,800. A conservative approach to silviculture spending, in combination with the existing funds in the Special Purposes Account, has helped to soften the impact of reduced harvest levels. At the end of the 5 year period in 2008, the SPA Account is able to provide for several additional years of decreased harvest levels and still support the silviculture budget. Moving ahead into the 2008-10 FMP period, it is expected that gradual increases in Forest Renewal Rates will be applied in order to ease into a stabilized account balance.

SEIM Analysis - Social Findings

Given that the economic environment will have bearing upon community's social conditions, the 2003-08 CMRMU SEIM analysis provided estimates as to the social impacts of the selected management alternative (below). Cochrane District unemployment rate dropped from 10% in 1996 to 7.3% in 2006, and it is postulated that closure of several Northeastern Ontario mills in 2006 may not be adequately reflected in the most recent census data. Reduced mill activity meant a shift in the relative labour force composition from manufacturing to other categories such as mining, construction, and the service industry.

Table 10. Social Impact in Cochrane District

	FMP Selected Alternative[1]	2008 Analysis[2]	% Variation
Labour Force Structure (Relative Composition Index, 100=existing)			
Agriculture	173	121	-27
Logging	466	473	9
Fishing and Trapping	8	11	50
Mining	4	9	100
Manufacturing	284	146	-52
Construction	5	11	120
Tans. Comm. & Utility	17	35	112
Trade and Finance	116	112	-3
Service	28	78	186
Average Wage ($)	25,722	45,727	
Family Indicators (number)			
Divorce (increase)	4.6	2.5	-46
Violence (decrease)	-1.8	-1	-44
Crime (number decreased)			
Murder	-0.1	0	-100
Attempted Murder	-0.1	0	-100
Robbery	-1.5	-0.8	-47
Property Crimes	-110.2	-60.7	-45
Break & Enter	-30.4	-16.8	-45

Theft	-75	-41.3	-45
Possession	-1.9	-1.1	-42
Fraud	-2.5	-1.4	-44
Total	-221.7	-122.2	-45
Sustainable House Price ($)	64,243	111,468	74
District Multiplier			

Notes: 1 - source of information is Table 7, Appendix 7, 2003-08 CMRMU FMP
2 - source of information is SEIM 2000 using 2007-08 AR-5 volumes, AR-11 expenditures, and November 2008 Prices and Conversion Factors

Decreases in the family indicators and crime were positive changes since the 2003-08 analysis, correlated with the increased employment rate, wages, and housing values.

SEIM Analysis - Environmental Findings

Timber harvesting, trucking, and the manufacture of wood products will also have an environment impact. Comparing the 2003-08 FMP SEIM results with the term end outputs, we see significant differences in which water usage, air emissions, energy consumption, and contaminants were all lower than projected.

Table 11. Environmental Impact in Cochrane District

	FMP Selected Alternative[1]	2008 Analysis[2]	% Variation
Water Usage (millions of cu.m)			
Intake	106,045,308	4,110,271	-96
Discharge	104,966,416	4,047,995	-96
Net	1,078,885	62,275	-94
Air Emissions (tonnes)			
Particulates	58.3	11.0	-81
Sulphur Dioxides	41.8	6.1	-85
Nitrogen oxides	44	5.6	-87
Volatile organic compounds	82.9	10.8	-87
Carbon monoxide	194.2	9.9	-95
Energy Consumption (terajoules)			
Coal	174.7	29.5	-83
Oil	267.8	42.9	-84
Natural Gas	110.8	102.2	-8
Hydroelectricity	22.0	42.3	92
Nuclear Steam	3,473.3	4.7	-100
TOTAL	4,048.6	257.6	-94
Solid waste (tonnes)	4,366.6	707.6	-84

Contaminants (tonnes)			
Ammonia nitrate	0.708	0.404	-43
Oil and grease	0.42	0.033	-92
TSS	35.137	39.021	11
Phosphorus	0.254	0.313	23
Cyanide	0.016	0.001	-94
Phenols	0.023	0.004	-83
Copper	0.005	0.001	-80
Lead	0.007	0.001	-86
Zinc	0.157	0.077	-51
Green GDP ($ thousands)			
Gross	60,287	20,010	-67
Green Cost	2,045	1,196	-42
Green GDP	58,242	18,814	-68

Notes: 1 - source of information is Table 8, Appendix 7, 2003-08 CMRMU FMP
2 - source of information is SEIM 2000 using 2007-08 AR-5 volumes, AR-11 expenditures, and November 2008 Prices and Conversion Factors

Differences in the forecast versus the 2008 SEIM analysis can be attributed to lower production levels overall, and the movement of more fibre to facilities outside of Cochrane District than originally modeled (23% of forecast volume vs. 36% actual).

Summary

Variations in economic, social, and environmental impacts between the 2003-08 socio-economic analysis and the Year 10 analysis can be attributed to the following factors:

- Under achievement of the forecasted volume meant lower economic contributions from the forestry sector (sales, wages, and employment).
- Utilization by mills other than those forecasted, meant reduced industrial output and lessened the environmental impacts to the Cochrane District.
- A gradual downsizing of the forest industry resulted in movement from manufacturing to other occupation groups.
- Social indicators saw positive changes between terms; this positive shift may be attributed to increased employment and wages.
- Environmental impacts were less than predicted due to reduced industrial output.

Two status reports for the implementation of 2005 IFA recommendations have been submitted. The reports detailed the progress in addressing each of the recommendation assigned to the MNR. The majority of actions required to address the 18 audit recommendations have been completed or have started and are classified as ongoing. All of the action statements have either been addressed as complete or are in progress.

Conclusion

Based on the level of objective achievement as described above and the current status of the 2005 independent forest audit action plan, it is concluded that the implementation of planned operations has provided for the long-term sustainability of the Crown forest.

Appendices

MANAGEMENT UNIT NAME:
Cochrane Moose
PLAN PERIOD: 2008 To
2010
ANNUAL REPORT:
2009 To 2010

AR-7: Summary of Planned and Actual Harvest Area

				Area (ha) - Annualized													
				PLANNED HARVEST			ACTUAL HARVEST										
Forest Unit				Past Plans			Past Plans						Current Plan				
													2008-2010			Projections	
1993-1998	1998-2003	2003-2008	2008-2010	1993-1998 ****	1998-2003 ***	2003-2008 **	1993-1998 ****		1998-2003 ***		2003-2008 **		Planned Harvest	Actual Harvest *		Medium-Term 2018	Long-Term 2108
							Harvest	Natural	Harvest	Natural	Harvest	Natural		Harvest	Natural		
SP4			BOG	33.2			25.8	-			0.1	-	-	-	-	na	na
BW	BW	BW1	BW1	176.0	20.4	-	101.0	-	13.6	-	-	-	-	-	-	na	na
OC	OC	LC1	LC1	-	92.4	231.3	-	-	33.8	-	93.3	-	222.5	56.2	-	na	na
			LH1			-					-	-	-	-	-	na	na
	Mxcon	MW1	MW1		378.2	10.2			244.9	-	7.3	-	10.0	8.3	-	na	na
	Mxwd	MW2	MW2		148.2	196.9			98.9	-	113.1	-	194.5	15.5	-	na	na
	MxHwd				21.2				25.4								
PJ	PJ1	PJ1	PJ1	73.0	168.4	125.9	62.2	-	143.0	-	101.1	-	126.0	31.1	-	na	na

Forest Unit				Past Plans			Past Plans						Current Plan				
							1993-1998 ****		1998-2003 ***		2003-2008 **		2008-2010			Projections	
														Actual Harvest *			
1993-1998	1998-2003	2003-2008	2008-2010	1993-1998 ****	1998-2003 ***	2003-2008 **	Harvest	Natural	Harvest	Natural	Harvest	Natural	Planned Harvest	Harvest	Natural	Medium-Term 2018	Long-Term 2108
						109.6					87.0	-	95.5	-	-	na	na
PO	PO	PO1	PO1	913.0	468.2	417.9	567.6	-	376.4	-	290.9	-	415.5	124.1	-	na	na
SP1	SP1	SBC	SBC	758.8	455.0	2,878.7	640.2	-	406.4	-	1,029.5	-	2,870.5	343.3	-	na	na
SP2	SP2	SBH	SBH	1,944.4	1,897.4	35.9	1,682.2	-	1,439.9	-	7.2	-	36.0	11.8	-	na	na
SP3	SP3	SP1	SP1	1,642.8	1,401.2	339.5	1,081.0	-	563.1	-	157.4	-	339.5	124.6	-	na	na
BF	BF	SF1	SF1	82.6	2.8	102.1	45.8	-	14.3	-	57.6	-	101.5	31.0	-	na	na
																na	na
Total				5,623.8	5,053.4	4,448.0	4,205.8	-	3,359.7	-	1,944.6	-	4,411.5	745.9	-	-	-

* 2008-09 Annual Report Data

** AR-1 from the 2007-2008 Annual Report

*** Table 4's from the 2005 IFA Plan Terms 1998-2003

**** Table 4's from the 2005 IFA Plan Terms 1993-1998

MANAGEMENT UNIT NAME: Cochrane Moose
PLAN PERIOD: 2008 To 2010
ANNUAL REPORT: 2009 To 2010

AR-8: Summary of Planned and Actual Harvest Volume

	Volume ('000 m^3) - Annualized									
	PLANNED HARVEST VOLUME			ACTUAL HARVEST VOLUME						
	Past Plans			Past Plans			Current Plan			
							2008-2010		Projections ***	
Species	1993-1998 ****	1998-2003 ****	2003-2008 ****	1993-1998 ****	1998-2003 ****	2003-2008 *****	Planned Harvest **	Actual Harvest*	Medium-Term 2018	Long-Term 2108
Sp	315,988.0	312,875.0	320,279.8	295,917.0	177,084.9	120,048.2	286,702.0	47,563.0	282,136.9	235,088.3
Bf	16,088.0	7,145.0	9,108.8	14,276.0	5,985.4	7,439.8	9,943.5	2,352.0	7,145.6	13,088.3
Pj	11,162.0	16,984.0	26,159.0	15,380.0	19,043.3	27,322.2	37,533.0	9,467.0	25,717.5	31,823.4
Ce (Oc)	231.0	8,768.0	9,936.4	381.0	132.5	10.2	2,703.5	1,254.0	766.7	560.0
La						3,540.0	16,909.0	428.0	10,153.7	7,482.3
Po	119,773.0	69,854.0	69,786.8	56,149.0	35,208.8	25,798.8	55,173.5	14,563.0	75,000.0	92,163.6
Pb						-	-	-	-	-
Bw	13,618.0	2,848.0	5,622.0	1,953.0	729.0	450.4	4,427.0	2,607.0	4,293.8	3,335.3
Pw						-	-	-	-	-
Pr						-	-	-	-	-
Oh						-	15.0	-	-	
Biofibre (Mx)								967.0		
Total	476,860.0	418,474.0	440,892.8	384,056.0	238,183.9	184,609.6	413,406.5	79,201.0	405,214.2	383,541.2

Sources:
*2008-2009 Annual Report
** FMP-17 2008-2010 CM FMP
*** 1.3.10 SFMM dat file
**** Tables 3A and 3B from the 2005 IFA
***** AR4 from 2007-08 Annual Report

MANAGEMENT UNIT NAME: Cochrane Moose
PLAN PERIOD: 2008 To 2010
ANNUAL REPORT: 2009 To 2010

AR-9: Summary of Planned and Actual Renewal, Tending and Protection Operations

Operation	Area (ha) - Annualized							
	PLANNED			ACTUAL			PLANNED	ACTUAL
	Past Plans			Past Plans			Current Plan	Current Plan
	1993-1998 *	1998-2003 *	2003-2008 *	1993-1998 *	1998-2003 *	2003-2008 **	2008-2010	2008-2010 ***
Renewal								
Natural Regeneration								
Clearcut Silvicultural System (even-aged) Shelterwood Silvicultural System (even-aged) Selection Silvicultural System - Selection Harvest (uneven-aged)	3,992.6	4,332.4	2,818.0	2,105.4	3,663.6	705.7	3,547.0	273.7
Artificial Regeneration								
Planting (includes area based planting)	531.2	1,211.6	1,356.2	1,355.2	992.6	1,420.8	172.0	413.2
Seeding	172.8	365.8	-	440.8	-	58.8	-	
Scarification	112.0	-	-	-	-	-	-	
Total Renewal	4,808.6	5,909.8	4,174.2	3,901.4	4,656.2	2,185.3	3,719.0	686.9
Site Preparation (mechanical, chemical, prescribed burn)								
Mechanical	208.2	631.8	200.0	381.0	130.6	74.0	247.5	35.0
Chemical	-	-	-	-	71.2	81.8	180.5	34.1
Prescribed Burn	140.0	-	-	-	32.4	202.1	-	
Total Site Preparation	348.2	631.8	200.0	381.0	234.2	357.9	428.0	69.1
Tending								
Cleaning	1,280.0	1,278.2	1,143.6	1,349.0	677.4	1,122.5	1,058.0	105.4
Spacing, Pre-Commercial Thinning, Improvement Cutting								

Operation	**Past Plans**			**Past Plans**			**Current Plan**	**Current Plan**
	1993-1998 *	**1998-2003 ***	**2003-2008 ***	**1993-1998 ***	**1998-2003 ***	**2003-2008 ****	**2008-2010**	**2008-2010 *****
Selection Silvicultural System (uneven-aged)								
Total Tending	1,280.0	1,278.2	1,143.6	1,349.0	677.4	1,122.5	1,058.0	105.4
Protection (Insect Pest Control)								

Source:
* Table 6 from the 2005 IFA
** AR-7 from the 2007-2008 Annual Report
*** 2008-2009 Annual Report GIS data

MANAGEMENT UNIT NAME: Cochrane Moose
PLAN PERIOD: 2005 To 2010
ANNUAL REPORT: 2009 To 2010

AR-10: Summary of Harvest and Regeneration Trends

		Term			
Forest Unit		**1993-1998 ***	**1998-2003 ***	**2003-2008 *****	**2008-2010 ****
All FU's	**Harvest/Salvage (ha)**	21029.0	16798.7	9722.8	745.9
	Surveyed (ha)	****15960	*****22371.5	31608.8	5190.0
	Regenerated (ha)	19507.0	23281.0	10926.6	686.9
	Unavailable for Regeneration (ha)	na	na	na	na
	Un-surveyed (ha)	na	na	na	na
	Percent FU Successfully Regenerated	92.8%	138.6%	112.4%	92.1%

Source:

* From the 2005 IFA
** 2008-2009 Annual Report
*** 2007-2008 Annual Report
**** Page 57 of the 2005 IFA
***** AR-7 from the 2002 AR

MANAGEMENT UNIT NAME: Cochrane Moose

PLAN PERIOD: 2008 To 2010

ANNUAL REPORT: 2009 To 2010

AR-11: Summary of Forest Condition for the Available Managed Crown Productive Forest

Forest Unit (or WG or Provincial Forest Type)				Age/Condition Class	Area (ha)						
					Past Plans			Current Plan 2008-2010			
										Projections	
1993-1998	1998-2003	2003-2008	2008-2010		1993-1998 ***	1998-2003 ***	2003-2008 **	Plan Start 2008 *	Plan End 2010	Medium-Term 2018	Long-Term 2108
BW	BW	BW	BWT	Depleted	0	0	332	30	na	na	na
				B&S	1,009	0					
				Below Regen Standard	0	0	na	12	na	na	na
				0-20	0	157	100	41	na	na	na
				21-40	69	13	1	79	na	na	na
				41-60	434	61	447	241	na	na	na
				61-80	714	590	292	294	na	na	na
				81-100	1,351	793	516	206	na	na	na
				101-120	1,023	0	0	13	na	na	na
				121-140	106	1	0	0	na	na	na

				141-160	0	0	0	0	na	na	na
				161-180	0	0	0	0	na	na	na
				181-200	0	0	0	0	na	na	na
				201+	0	0	0	0	na	na	na
				Forest Unit Subtotal	**4,706**	**1,615**	1687	918	na	na	na
OC	**OC**	**OCCEL**	**MCL**	Depleted	0	0	442	23030	na	na	na
				B&S	134	146					
				Below Regen Standard	0	0	na	19681	na	na	na
				0-20	0	30	314	17206	na	na	na
				21-40	12	87	46	15605	na	na	na
				41-60	42	480	462	15748	na	na	na
				61-80	54	1,245	955	37166	na	na	na
				81-100	221	2,925	2723	39608	na	na	na
				101-120	40	2,005	1620	52561	na	na	na
				121-140	242	3,451	3268	158670	na	na	na
				141-160	108	586	675	129026	na	na	na
				161-180	210	63	94	51285	na	na	na
				181-200	0	435	443	1747	na	na	na
				201+	0	0	0	166	na	na	na
				Forest Unit Subtotal	**1,063**	**11,453**	**11,043**	**561,500**	na	na	na
	Mxhwd	**A**	**TOL**	Depleted	0	0		0	na	na	na
				B&S	0	165					
				Below Regen Standard	0	0		0	na	na	na
				0-20	0	155		0	na	na	na

				21-40	0	283		0	na	na	na
				41-60	0	1,963		0	na	na	na
				61-80	0	3,482		0	na	na	na
				81-100	0	299		0	na	na	na
				101-120	0	0		0	na	na	na
				121-140	0	0		0	na	na	na
				141-160	0	0		0	na	na	na
				161-180	0	0		0	na	na	na
				181-200	0	0		0	na	na	na
				201+	0	0		0	na	na	na
				Forest Unit Subtotal	**0**	**6,347**		**0**	na	na	na
	Mxcon		MCU	Depleted	0	0		2931	na	na	na
				B&S	0	87					
				Below Regen Standard	0	0		1526	na	na	na
				0-20	0	1,053		7765	na	na	na
				21-40	0	4,346		5035	na	na	na
				41-60	0	4,382		9125	na	na	na
				61-80	0	3,842		10870	na	na	na
				81-100	0	1,655		9820	na	na	na
				101-120	0	763		6583	na	na	na
				121-140	0	545		16531	na	na	na
				141-160	0	0		11261	na	na	na
				161-180	0	0		7523	na	na	na
				181-200	0	0		294	na	na	na

				201+	0	0		10	na	na	na
				Forest Unit Subtotal	**0**	**16,673**		**89,276**	na	na	na
	Mxwd		**MIX**	Depleted	0	0		1005	na	na	na
				B&S	0	0					
				Below Regen Standard	0	0		3	na	na	na
				0-20	0	152		2459	na	na	na
				21-40	0	1,217		5109	na	na	na
				41-60	0	5,219		5096	na	na	na
				61-80	0	5,954		8259	na	na	na
				81-100	0	1,607		2908	na	na	na
				101-120	0	218		1747	na	na	na
				121-140	0	137		594	na	na	na
				141-160	0	0		113	na	na	na
				161-180	0	0		3	na	na	na
				181-200	0	0		0	na	na	na
				201+	0	0		0	na	na	na
				Forest Unit Subtotal	**0**	**14,504**		**27295**	na	na	na
PJ	**PJ1**	**PJ**	**PJK**	Depleted	0	0	1861	274	na	na	na
				B&S	5,757	29					
				Below Regen Standard	0	0	na	1242	na	na	na
				0-20	1,344	3,560	2762	2140	na	na	na
				21-40	333	237	1254	2142	na	na	na
				41-60	1,228	3,130	2857	1269	na	na	na
				61-80	4,659	6,040	4964	1820	na	na	na

				81-100	2,199	4,361	4791	2613	na	na	na
				101-120	1,741	1,310	1536	1120	na	na	na
				121-140	707	235	193	522	na	na	na
				141-160	473	0	9	0	na	na	na
				161-180	216	0	0	0	na	na	na
				181-200	0	41	41	0	na	na	na
				201+	0	0	0	0	na	na	na
				Forest Unit Subtotal	**18,657**	**18,943**	**20,269**	**13,142**	na	na	na
			PWR	Depleted	0	0		0	na	na	na
				B&S	0	0					
				Below Regen Standard	0	0		0	na	na	na
				0-20	0	0		0	na	na	na
				21-40	0	0		0	na	na	na
				41-60	0	0		0	na	na	na
				61-80	0	0		0	na	na	na
				81-100	0	0		0	na	na	na
				101-120	0	0		0	na	na	na
				121-140	0	0		0	na	na	na
				141-160	0	0		0	na	na	na
				161-180	0	0		0	na	na	na
				181-200	0	0		0	na	na	na
				201+	0	0		0	na	na	na
				Forest Unit Subtotal	**0**	**0**		**0**	na	na	na
PO	**PO1**	**PO**	**POP**	Depleted	0	0	6072	1981	na	na	na

	PO3			B&S	12,255	2,891					
				Below Regen Standard	0	0	na	991	na	na	na
				0-20	209	12,136	5757	3489	na	na	na
				21-40	922	1,707	6295	5991	na	na	na
				41-60	8,314	6,305	12932	4854	na	na	na
				61-80	16,002	13,820	16145	13576	na	na	na
				81-100	6,606	3,461	3481	2327	na	na	na
				101-120	1,956	625	631	405	na	na	na
				121-140	1,005	43	159	36	na	na	na
				141-160	239	0	114	0	na	na	na
				161-180	64	0	3	0	na	na	na
				181-200	0	0	0	0	na	na	na
				201+	0	0	0	0	na	na	na
				Forest Unit Subtotal	**47,572**	**40,988**	**51,587**	**33,650**	na	na	na
SB	**SP1**	**SB**		Depleted	0	0	47608				
		SW		B&S	71,399	525					
		S		Below Regen Standard	0	0	na				
				0-20	2,443	9,982	36807				
				21-40	3,915	2,527	13779				
				41-60	8,423	4,135	22531				
				61-80	29,526	4,968	50637				
				81-100	26,629	8,463	58122				
				101-120	29,018	1,527	84537				
				121-140	63,661	3,560	192783				

				141-160	63,238	3,361	119232				
				161-180	80,732	46	4696				
				181-200	1,323	39	757				
				201+	665	0	37				
				Forest Unit Subtotal	**380,972**	**39,133**	**631,526**				
SW	SP2			Depleted	0	0					
				B&S	1,408	3,699					
				Below Regen Standard	0	0					
				0-20	483	13,947					
				21-40	45	5,679					
				41-60	0	12,357					
				61-80	11	28,515					
				81-100	0	29,965					
				101-120	0	37,040					
				121-140	0	63,403					
				141-160	0	32,537					
				161-180	0	287					
				181-200	0	105					
				201+	0	0					
				Forest Unit Subtotal	**1,947**	**227,534**					
	SP3			Depleted	0	0					
				B&S	0	1,720					
				Below Regen Standard	0	0					
				0-20	0	7,896					

				21-40	0	2,688					
				41-60	0	4,437					
				61-80	0	22,676					
				81-100	0	19,082					
				101-120	0	57,794					
				121-140	0	145,228					
				141-160	0	66,693					
				161-180	0	2,982					
				181-200	0	267					
				201+	0	0					
				Forest Unit Subtotal	**0**	**331,463**					
BF	**BF**	**B**		Depleted	0	0	820				
				B&S	1,318	146					
				Below Regen Standard	0	0	na				
				0-20	33	407	221				
				21-40	347	1,162	1,051				
				41-60	1,543	1,296	2,431				
				61-80	2,528	1,361	2,040				
				81-100	593	462	874				
				101-120	345	172	150				
				121-140	295	70	91				
				141-160	138	0	0				
				161-180	22	0	0				
				181-200	0	0	0				
				201+	0	0	0				

				Forest Unit Subtotal	**7,162**	**5,076**	**7,677**		-	-	-
All Fus				Depleted	0	0	57,136	29,253	na	na	na
				B&S	93,280	9,408					
				Below Regen Standard	0	0	na	23,455	na	na	na
				0-20	4,512	49,475	45,961	33,100	na	na	na
				21-40	5,643	19,946	22,425	33,962	na	na	na
				41-60	19,984	43,765	41,660	36,332	na	na	na
				61-80	53,494	92,493	75,032	71,986	na	na	na
				81-100	37,599	73,073	70,508	57,482	na	na	na
				101-120	34,123	101,454	88,474	62,430	na	na	na
				121-140	66,016	216,673	196,493	176,353	na	na	na
				141-160	64,196	103,177	120,029	140,400	na	na	na
				161-180	81,244	3,378	4,793	58,812	na	na	na
				181-200	1,323	887	1,241	2,041	na	na	na
				201+	665	0	37	176	na	na	na
				All Forest Unit Total	**462,079**	**713,729**	723,789	725,780	na	na	na
				Total Productive Forest	**462,079**	**713,729**	**723,789**	**725,780**	-	-	-

Sources:
* FMP 2 from the 2008-2010 FMP
** FMP-2A and B from the 2003-2008 FMP
*** Table 5 from the 2005 IFA

MANAGEMENT UNIT NAME: Cochrane Moose

PLAN PERIOD: 2008 To 2010

ANNUAL REPORT: 2009 To 2010

AR-12: Summary of Habitat for Species at Risk and Selected Wildlife Species

	Area of Habitat (ha)							
	Past Plans			Current Plan 2008-2010***				
				Plan Start	Projections			Plan End
Wildlife Species	1993-1998	1998-2003	2003-2008 **	2003 *	Short-Term 2003 *	Medium- Term 2023 *	Long-Term 2103 *	2003 *
bay breasted warbler	na	na	63,094	63,094	63,094	62,058	61,410	63,094
black backed woodpecker	na	na	37,959	37,959	37,959	34,459	34,941	37,959
black bear foraging	na	na	1,813	1,813	1,813	1,607	1,789	1,813
black bear fall winter	na	na	34,943	34,943	34,943	36,320	37,900	34,943
boreal chickadee	na	na	214,032	214,032	214,032	215,244	208,905	214,032
blue spotted salamander	na	na	0	0	0	0	0	0
lynx	na	na	31,202	31,202	31,202	30,807	34,250	31,202
caribou	na	na	4,361	4,361	4,361	3,323	2,953	4,361
deer mouse	na	na	10,453	10,453	10,453	10,568	11,395	10,453
great gray owl	na	na	15,264	15,264	15,264	13,185	11,988	15,264
least flycatcher	na	na	195,899	195,899	195,899	196,983	195,399	195,899
marten	na	na	80,414	80,414	80,414	77,019	68,666	80,414
moose foraging	na	na	9,947	9,947	9,947	9,854	10,217	9,947
moose winter	na	na	78,076	78,076	78,076	79,293	79,319	78,076
northern flying squirrel	na	na	82,273	82,273	82,273	78,275	73,949	82,273
pileated woodpecker	na	na	427	427	427	1,709	1,504	427

ruby crowned kinglet	na	na	369,185	369,185	369,185	314,959	345,463	369,185
					Projections			
Wildlife Species	1993-1998	1998-2003	2003-2008 **	Plan Start 2003 *	Short Term *	Medium Term *	Long Term *	Plan End 2003 *
ruffed grouse	na	na	10,826	10,826	10,826	12,276	16,226	10,826
snowshoe hare	na	na	31,202	31,202	31,202	30,807	34,250	31,202
spruce grouse	na	na	4,081	4,081	4,081	4,490	4,534	4,081
white throated sparrow	na	na	18,937	18,937	18,937	22,253	20,296	18,937

Source: * FMP-13 2008-2010 FMP
** FMP-12 2003-2008 FMP
*** The 2008-2010 Contingency FMP numbers were based on the 2003-2008 FMP (therefore numbers will be the same).

MANAGEMENT UNIT NAME: Cochrane Moose River Management Unit

PLAN PERIOD: 2003 TO 2023

ANNUAL REPORT: April 1, 2007 to March 31, 2008

AR-13a Annual Report of Assessment of Regeneration Success

				Area Assessed This Year (ha)					Area Assessed To Date (ha)		
				Area Successfully Regenerated							
Forest Unit	Silvicultural Ground Rule	Projected Forest Unit	Forecast of Assessment (ha)	Projected Forest Unit	Other Forest Unit	Total	Area Not Successfully Regenerated	Total	Area Assessed	Successfully Regenerated to Projected Forest Unit	Total Area Successfully Regenerated
Harvest	-	-	-	-	-	-	-	-	-		
BOG	SBC-111-SBC-Ec	SBC	0			0.0	0.0	0.0	87.1	52.6	57.5
	Forest Unit Subtotal		0	0.0	0.0	0.0	0.0	0.0	87.1	52.6	57.5
BW1	BW1-111-BW1-Ec	BW1	150			0.0	0.0	0.0	168.0	0.0	0.0
	Forest Unit Subtotal		150	0.0	0.0	0.0	0.0	0.0	168.0	0.0	0.0
LC1	LC1-111-LC1-Ec	LC1	251			0.0	54.4	54.4	310.5	78.9	222.6
	LC1-121-LC1-B2	LC1				0.0	0.0	0.0	4.8	0.0	0.0
	LC1-123-LC1-B2	LC1				0.0	0.0	0.0	1.3	0.0	0.0
	LC1-323-SBC-I2	SBC				0.0	0.0	0.0	0.6	0.6	0.6
	Forest Unit Subtotal		251	0.0	0.0	0.0	54.4	54.4	317.2	79.5	223.2
LH1	LH1-111-LH1-Ec	LH1				0.0	0.0	0.0	0.0	0.0	0.0

	Forest Unit Subtotal		0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MW1	MW1-121-MW1-B2	MW1	0			0.0	0.0	0.0	0.0	0.0	0.0
	MW1-111-MW1-Ec	MW1				0.0	0.0	0.0	35.6	0.0	35.6
	Forest Unit Subtotal		0	0.0	0.0	0.0	0.0	0.0	35.6	0.0	35.6
MW2	MW2-111-MW2-Ec	MW2				0.0	0.0	0.0	737.8	141.3	585.1
	MW2-111-PO1-Ec	PO1		45.8		45.8	0.0	45.8	45.8	45.8	45.8
	MW2-121-MW2-B2	MW2	710			0.0	0.0	0.0	8.2	0.0	8.2
	MW2-123-MW2-I1	MW2				0.0	0.0	0.0	34.5	0.0	34.5
	MW2-123-SP1-I2	SP1				0.0	0.0	0.0	19.8	19.8	19.8
	Forest Unit Subtotal		710	45.8	0.0	45.8	0.0	45.8	846.1	206.9	693.4
PJ1	PJ1-123-PJ1-I1	PJ1	560			0.0	0.0	0.0	0.0	0.0	0.0
	PJ1-221-PJ1-I1	PJ1				0.0	0.0	0.0	30.9	0.0	25.1
	PJ1-222-PJ1-I1	PJ1				0.0	0.0	0.0	10.1	0.0	10.1
	PJ1-111-PJ1-Ec	PJ1				0.0	0.0	0.0	264.3	22.0	262.5
	PJ1-121-PJ1-B2	PJ1				0.0	0.0	0.0	95.8	23.3	37.0
	PJ1-323-PJ1-I2	PJ1				0.0	0.0	0.0	0.0	0.0	0.0
	Forest Unit Subtotal		560	0.0	0.0	0.0	0.0	0.0	401.1	45.3	334.7
PJ2	PJ2-123-PJ2-I2	PJ2	50			0.0	0.0	0.0	0.0	0.0	0.0
	Forest Unit Subtotal		50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PO1	PO1-121-SBC-B2	SBC				0.0	0.0	0.0	60.0	0.0	0.0
	PO1-111-PO1-Ec	PO1	2640	41.0		41.0	0.0	41.0	3614.1	1534.8	3267.3
	PO1-111-MW2-Ec	MW2				0.0	0.0	0.0	29.4	29.4	29.4
	PO1-111-LC1-Ec	LC1				0.0	0.0	0.0	3.3	3.3	3.3
	PO1-111-SP1-Ec	SP1				0.0	0.0	0.0	0.5	0.5	0.5

	PO1-111-SF1-B2	SF1				0.0	0.0	0.0	2.4	0.0	0.0
	PO1-113-SP1-B1	SP1				0.0	0.0	0.0	13.9	6.7	13.9
	PO1-121-MW2-B2	MW2				0.0	0.0	0.0	31.5	0.0	31.5
	PO1-123-MW2-I2	MW2				0.0	0.0	0.0	0.0	0.0	0.0
	PO1-123-MW2-I1	MW2				0.0	0.0	0.0	3.5	3.5	3.5
	PO1-123-SP1-I1	SP1				0.0	0.0	0.0	6.0	6.0	6.0
	Forest Unit Subtotal		2640	41.0	0.0	41.0	0.0	41.0	3764.6	1584.2	3355.4
SBC	SBC-111-SBC-Ec	SBC	16944			0.0	22.3	22.3	13969.5	5326.6	10054.3
	SBC-111-LC1-Ec	LC1				0.0	0.0	0.0	262.8	262.8	262.8
	SBC-111-MW2-Ec	MW2				0.0	0.0	0.0	6.1	6.1	6.1
	SBC-121-SBC-B2	SBC				0.0	0.0	0.0	1684.5	421.8	1256.0
	SBC-223-SBC-I2	SBC				0.0	0.0	0.0	73.2	0.0	73.2
	SBC-131-SBC-B1	SBC				0.0	0.0	0.0	318.4	285.3	318.4
	SBC-121-SBC-I1	SBC				0.0	0.0	0.0	1255.5	0.0	575.6
	SBC-113-SBC-Ec	SBC				0.0	0.0	0.0	250.0	0.0	0.0
	SBC-123-SBC-I2	SBC				0.0	0.0	0.0	222.0	0.0	0.0
	SBC-113-SBC-B1	SBC				0.0	0.0	0.0	430.8	418.8	430.8
	SBC-121-MW2-B2	MW2				0.0	0.0	0.0	148.2	141.2	148.2
	SBC-121-SF1-B2	SF1				0.0	0.0	0.0	31.1	31.1	31.1
	SBC-121-SP1-B2	SP1				0.0	0.0	0.0	71.6	56.8	71.6
	SBC-123-SBC-I1	SBC				0.0	0.0	0.0	195.9	195.9	195.9
	SBC-123-SP1-I1	SP1				0.0	0.0	0.0	182.9	182.9	182.9
	SBC-223-PJ1-I2	PJ1				0.0	0.0	0.0	11.2	11.2	11.2
	SBC-313-SBC-I1	SBC				0.0	0.0	0.0	0.0	0.0	0.0

	SBC-323-SBC-I2	SBC				0.0	0.0	0.0	10.3	10.3	10.3
	SBC-323-SP1-I2	SP1				0.0	0.0	0.0	12.0	12.0	12.0
	Forest Unit Subtotal		16944	0.0	0.0	0.0	22.3	22.3	19136.0	7362.8	13640.4
SBH	SBH-111-SBH-Ec	SBH	0			0.0	0.0	0.0	3.0	0.0	0.5
	SBH-121-SBH-B2	SBH				0.0	0.0	0.0	0.7	0.0	0.7
	Forest Unit Subtotal		0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	1.2
SF1	SF1-123-SF1-I1	SF1	860			0.0	0.0	0.0	5.6	5.6	5.6
	SF1-111-SF1-Ec	SF1				0.0	0.0	0.0	727.8	18.3	476.4
	SF1-111-MW2-Ec	MW2				0.0	27.9	27.9	27.9	0.0	0.0
	SF1-121-SF1-B2	SF1				0.0	28.1	28.1	140.3	0.0	12.6
	SF1-121-MW2-B2	MW2				0.0	0.0	0.0	33.8	33.8	33.8
	SF1-121-SBC-B2	SBC				0.0	0.0	0.0	82.2	82.2	82.2
	SF1-121-SP1-B2	SP1				0.0	0.0	0.0	18.3	18.3	18.3
	SF1-123-SF1-I2	SF1				0.0	0.0	0.0	7.5	0.0	7.5
	SF1-323-MW2-I1	MW2				0.0	0.0	0.0	0.0	0.0	0.0
	Forest Unit Subtotal		860	0.0	0.0	0.0	56.0	56.0	1043.4	158.2	636.4
SP1	SP1-123-SP1-I1	SP1	710			0.0	0.0	0.0	95.5	79.2	95.5
	SP1-111-SP1-Ec	SP1				0.0	0.0	0.0	283.4	74.5	279.0
	SP1-121-SP1-B2	SP1				0.0	0.0	0.0	169.9	169.9	169.9
	SP1-121-SBC-B2	SBC				0.0	0.0	0.0	78.3	0.0	3.8
	SP1-123-SBC-I1					0.0	0.0	0.0	93.0	93.0	93.0
	Forest Unit Subtotal		710	0.0	0.0	0.0	0.0	0.0	720.1	416.6	641.2
	Harvest Subtotal		22520	86.8	0.0	86.8	132.7	219.5	26116.3	9651.3	19251.9

						-					
Natural Disturbance		-	-	-	-	-	-	-	-		
BOG						0.0		0.0	416.1	13.5	34.2
BW1	BW1-111-BW1-P1	BW1			8.3	8.3		8.3	8.3	0.0	8.3
LC1	LC1-111-LC1-P1	LC1				0.0		0.0	53.4	15.2	22.6
PJ1	PJ1-111-PJ1-P1	PJ1				0.0		0.0	563.1	419.2	476.1
PO1	PO1-111-PO1-P1	PO1		34.4	7.4	41.8	20.5	62.3	267.3	56.8	189.4
SBC	SBC-111-SBC-P1	SBC		68.7	46.8	115.5		115.5	4107.5	1100.7	1741.2
SF1	SF1-111-SF1-P1	SF1			48.1	48.1		48.1	76.8	0.0	76.8
	Forest Unit Subtotal										
	Natural Disturbance Subtotal			103.1	110.6	213.7	20.5	234.2	5492.5	1605.4	2548.6
Total				189.9	110.6	300.5	153.2	453.7	31608.8	11256.7	21800.5

MANAGEMENT UNIT NAME: Cochrane-Moose River Crown MU

PLAN PERIOD: 2008 To 2010

ANNUAL REPORT: 2008 To 2009 (1 year)

AR-13b: Summary of Assessment of Regeneration and Silvicultural Success

		Area Assessed				
		Area Successfully Regenerated			Area Not Successfully Regenerated	Total Area Assessed
Forest Unit	Silvicultural Ground Rule	Projected Forest Unit	Other Forest Unit	Total		
Harvest						
LC1	LC1-111-LC1-E1	102.1	53.7	155.8		155.8
-	LC1-123-LC1-B2	7.2		7.2		7.2
-	N/A			0.0	118.6	118.6
-	Forest Unit Subtotal	109.3	53.7	162.9	118.6	281.5
MW2	MW2-111-MW2-E1	25.4	52.3	77.7		77.7
-	MW2-111-PO1-E1	5.5		5.5		5.5
-	N/A			0.0	28.7	28.7
-	Forest Unit Subtotal	30.8	52.3	83.1	28.7	111.8
PJ1	N/A	0.0	0.0	0.0	41.6	41.6
-	Forest Unit Subtotal	0.0	0.0	0.0	41.6	41.6
PJ2	PJ2-111-PJ2-E1		5.4	5.4		5.4
-	N/A			0.0	9.0	9.0
-	Forest Unit Subtotal	0.0	5.4	5.4	9.0	14.4
PO1	PO1-111-PO1-E1		37.1	37.1		37.1

-	N/A			0.0	20.5	20.5
-	Forest Unit Subtotal	0.0	37.1	37.1	20.5	57.6

		Area Successfully Regenerated			Area Not Successfully Regenerated	Total Area Assessed
Forest Unit	Silvicultural Ground Rule	Projected Forest Unit	Other Forest Unit	Total		
SBC	SBC-111-SBC-E1	2176.0	104.5	2280.5		2280.5
-	SBC-123-SF1-I1		33.3	33.3		33.3
-	SBC-223-SBC-I2	887.6	91.6	979.2		979.2
-	SBC-223-SF1-I2	12.3		12.3		12.3
-	N/A			0.0	1035.6	1035.6
-	Forest Unit Subtotal	3075.8	229.5	3305.3	1035.6	4340.9
SF1	SF1-111-SF1-E1	7.0	163.5	170.6		170.6
-	SF1-223-SF1-I2	22.1		22.1		22.1
-	N/A			0.0	21.0	21.0
-	Forest Unit Subtotal	29.1	163.5	192.6	21.0	213.6
SP1	SP1-111-SP1-E1	2.3	70.5	72.9		72.9
-	N/A			0.0	56.3	56.3
	Forest Unit Subtotal	2.3	70.5	72.9	56.3	129.2
	Harvest Subtotal	3247.4	612.0	3859.4	1331.2	5190.6
Natural Disturbance						
	Forest Unit Subtotal					
	Disturbance Subtotal					
Total		3247.4	612.0	3859.4	1331.2	5190.6

MANAGEMENT UNIT NAME: Cochrane Moose

PLAN PERIOD: 2008 To 2010

ANNUAL REPORT: 2009 To 2010

AR-14: Assessment of Objective Achievement

Management Objective/Indicator	Unit of Measure	Desireable Levels	Timing of Assessment	Targets		LTMD Projections			Assessment
				Lower limit	Upper limit	2003 (Plan Start)	2023 (Medium)	2103 (Long)	
Quantifiable **1. Forest Diversity Objective Group** **Sub Unit: Moose River** **A. Forest Unit Area (available and reserved)**		NA	NA	>=	<=				Assessment completed during the development of the FMP and concluded that The selected management alternative (i.e. the select) diversity values were within the acceptable natural range and considered sustainable. (See Appendix 10, Section 3 of the 2003-2008 FMP). The selected results were within the acceptable range for all forest diversity indicators. In terms of forest diversity the selected management alternative (select) was sustainable. Pg 168 of 2008-2010 CFMP.
Bog	ha			142,152	213,228	177,690	177,690	177,690	
Bw1	ha			207	621	414	457	420	
LC1	ha			9,160	27,480	18,320	21,111	34,661	
LH1	ha			-	-				
MW1	ha			967	2,902	1,935	3,781	8,805	
MW2	ha			6,727	20,182	13,455	14,506	16,488	
PJ1	ha			6,507	19,522	13,015	13,056	11,399	
PJ2	ha			3,957	11,877	7,915	7,965	7,495	
PO1	ha			5,081	15,243	10,162	10,418	10,733	

SBC	ha			187,352	562,057	374,705	377,865	365,877	
SBH	ha			8,769	26,307	17,538	16,396	14,736	
SF1	ha			8,852	26,557	17,705	18,420	22,784	
SP1	ha			19,426	58,278	38,852	34,454	23,132	
Sub Unit: Cochrane		NA	NA						Assessment completed during the development of the FMP and concluded that The selected management alternative (i.e. the select) diversity values were within the acceptable natural range and considered sustainable. (See Appendix 10, Section 3 of the 2003-2008 FMP). The selected results were within the acceptable range for all forest diversity indicators. In terms of forest diversity the selected management alternative (select) was sustainable. Pg 168 of 2008-2010 CFMP.
A. Forest Unit Area (available and reserved)				>=	<=				
Bog	ha			2,107	3,161	2,634	2,634	2,634	
Bw1	ha			534	1,603	1,069	1,254	1,499	
LC1	ha			7,892	23,676	15,784	15,759	15,758	
LH1	ha			15	46	31	31	31	
MW1	ha			91	273	182	212	272	
MW2	ha			6,966	20,899	13,933	12,986	12,566	
PJ1	ha			123	370	246	249	107	
PJ2	ha			59	178	119	222	894	
PO1	ha			12,166	36,498	24,332	24,439	23,237	
SBC	ha			15,263	45,789	30,526	32,890	34,585	
SBH	ha			492	1,477	985	969	848	
SF1	ha			5,856	17,569	11,713	11,817	10,633	
SP1	ha			1,314	3,943	2,629	2,863	3,836	
B. Age Class Structure - Mature %		NA	NA						Assessment completed during the development of the FMP

Sub Unit: Moose River		NA	NA					and concluded that The selected management alternative (i.e. the select) diversity values were within the acceptable natural range and considered sustainable. (See Appendix 10, Section 3 of the 2003-2008 FMP). The selected results were within the acceptable range for all forest diversity indicators. In terms of forest diversity the selected management alternative (select) was sustainable. Pg 168 of 2008-2010 CFMP.
Pine (PJ1, PJ2)	%			>=15%	48.9	42.4	25.1	
Spruce Upland (SF1, SP1)	%			>=15%	58.7	52	43.1	
Spruce Lowland (SBC, SBH, and LC1)	%			>=15%	74	67.1	50.2	
Hardwood (PO1, BW1)	%			>=15%	35.2	28.1	35.6	
Mixedwoods (MW1, MW2)	%			>=15%	49.8	45.4	54.1	
Sub Unit: Cochrane								
Pine (PJ1, PJ2)	%			>=15%	0	54.7	28.9	
Spruce Upland (SF1, SP1)	%			>=15%	23.1	24	27.8	
Spruce Lowland (SBC, SBH, and LC1)	%			>=15%	38.7	42.9	45.7	
Hardwood (PO1, BW1)	%			>=15%	42.6	47.7	27.9	
Mixedwoods (MW1, MW2)	%			>=15%	19.6	60.5	43.6	
C. Age Class Structure - Overmature %								Assessment completed during the development of the FMP and concluded that The selected management alternative (i.e. the select) diversity values were within the acceptable natural range and considered sustainable. (See Appendix 10, Section 3 of the 2003-2008 FMP). The selected results were within the acceptable range for all forest diversity indicators. In terms of forest diversity the selected management alternative (select) was sustainable. Pg 168 of 2008-2010 CFMP.
Sub Unit: Moose River				>=5%				
Pine (PJ1, PJ2)	%			>=5%	8.9	10.5	5.8	
Spruce Upland (SF1, SP1)	%			>=5%	37.3	26.9	18	
Spruce Lowland (SBC, SBH, and LC1)	%			>=5%	58.1	53.9	24.3	
Hardwood (PO1, BW1)	%			>=5%	10	23	14.9	
Mixedwoods (MW1, MW2)	%			>=5%	13.7	26.3	30.7	
Sub Unit: Cochrane								
Pine (PJ1, PJ2)	%			>=5%	0	0	9.1	
Spruce Upland (SF1, SP1)	%			>=5%	7.7	5	8.1	
Spruce Lowland (SBC, SBH, and LC1)	%			>=5%	16.6	12.9	13.7	
Hardwood (PO1, BW1)	%			>=5%	0.2	5	5	
Mixedwoods (MW1, MW2)	%			>=5%	1.5	6.6	13.4	

2. Social and Economic Group								A total of 100% of the available harvest area available from the selected management alternative was expected to be utilized as the timber demand exceeds the supply and markets will be sought for those species currently underutilized . Pg 169 of 2008-2010 CFMP.
A. SPF Wood Supply	1000 m3/yr	NA	NA		325,000	315,000	280,000	
	% change			+ or - 20% between term		-3.10%	17%	
B. Poplar Wood Supply	1000 m3/yr				75,000	70,000	75,000	
	% change			+ or - 20% between term		-7%	0%	
C. Poplar Veneer Supply	1000 m3/yr				11,701	10,288	8,438	
	% change			+ or - 20% between term		-12%	-16%	
3. Forest Cover Objective Group								The results of the selected management alternative were within the bounds of natural variation for all selected wildlife species and the alternative was considered sustainable. Pg 169 of 2008-2010 CFMP.
Sub Unit: Moose River				devcation from natural (-20%)				
A. Habitat for Selected Wildlife Species				lower limit				
Bay-breasted Warbler	HA	NA	NA	26,986	33,950	32,029	36,453	
Black-backed Woodpecker	HA			24,799	31,462	27,029	27,179	
Black Bear (foraging)	HA			26	1,793	1,570	1,721	
Black Bear (fall,winter)	HA			17,590	21,988	19,738	25,955	
Boreal Chickadee	HA			163,190	203,988	203,453	197,825	
Blue-spotted Salamander	HA			-				
Lynx	HA			19,337	25,590	22,356	24,885	
Woodland Caribou	HA			2,581	4,241	3,200	2,879	
Deer Mouse	HA			323	5,782	3,579	5,221	
Great Grey Owl	HA			1,758	2,197	3,343	3,073	
Least Flycatcher	HA			142,928	178,660	182,448	181,293	

Marten	HA			49,057	61,321	53,232	49,057	
Moose (foraging)	HA			284	5,292	2,913	4,118	
Moose (winter)	HA			36,023	45,029	47,935	49,044	
Northern Flying Squirrel	HA			42,067	52,584	47,877	48,750	
Pileated Woodpecker	HA			312	390	924	700	
Ruby-crowned Kinglet	HA			269,387	336,734	286,949	312,575	
Ruffed Grouse	HA			6,968	8,710	10,121	13,754	
Snowshoe Hare	HA			19,337	25,590	22,356	24,885	
Spruce Grouse	HA			186	3,927	4,302	4,521	
White-throated Sparrow	HA			628	11,999	12,527	11,655	
3. Forest Cover Objective Group		NA	NA					The results of the selected management alternative were within the bounds of natural variation for all selected wildlife species and the alternative was considered sustainable. Pg 169 of 2008-2010 CFMP.
Sub Unit: Cochrane				deveation from natural (-20%)				
A. Habitat for Selected Wildlife Species				lower limit				
Bay-breasted Warbler	HA			23,315	29,144	30,029	24,957	
Black-backed Woodpecker	HA			5,198	6,497	7,430	7,762	
Black Bear (foraging)	HA			1	20	37	68	
Black Bear (fall,winter)	HA			10,364	12,955	16,582	11,945	
Boreal Chickadee	HA			8,035	10,044	11,791	11,080	
Blue-spotted Salamander	HA			-				
Lynx	HA			4,490	5,612	8,451	9,365	

Woodland Caribou	HA			59	120	123	74	
Deer Mouse	HA			247	4,671	6,989	6,174	
Great Grey Owl	HA			6,221	13,067	9,842	8,915	
Least Flycatcher	HA			11,888	17,239	14,535	14,106	
Marten	HA			15,274	19,093	23,787	19,609	
Moose (foraging)	HA			245	4,655	6,941	6,099	
Moose (winter)	HA			26,438	33,047	31,358	30,275	
Northern Flying Squirrel	HA			23,751	29,689	30,398	25,199	
Pileated Woodpecker	HA			30	37	785	804	
Ruby-crowned Kinglet	HA			25,960	32,451	28,010	32,888	
Ruffed Grouse	HA			1,501	2,116	2,155	2,472	
Snowshoe Hare	HA			4,490	5,612	8,451	9,365	
Spruce Grouse	HA			10	154	188	13	
White-throated Sparrow	HA			361	6,938	9,726	8,641	
4. Silviculture Objective Group								
A. 'Renewal Revenues and Expenditures	revenue$>=expend.$	NA	NA	rev. minus expend. >=0	135,618	125,151	530,306	
B. Available Productive Forest Area	hectares			> 495767	495,767	502,322	500,996	
C. Total Forest Area	hectares			> 795280	795,280	802,443	801,117	NA
Indicators of Sustainability **Sub Unit: Moose River** **1. Forest Diversity Indicators of Sustainability**		NA	NA					NA

A. Forest Diversity Indices				>=	<=				
Shannon Weiner Index of Landscape Heterogeneity									
Forest Units	indicator			1.1296	1.7652	1.412	1.422	1.473	
Age Classes	indicator			2.036	3.5436	2.545	2.705	3.08	
Habitat Units	indicator			1.1488	1.7436	1.453	1.442	1.47	
Simpsons Index of Landscape Heterogeneity									
Forest Units	indicator			0.5064	0.7872	0.634	0.634	0.65	
Age Classes	indicator			0.7248	1.1244	0.906	0.921	0.951	
Habitat Units	indicator			0.5024	0.7716	0.634	0.631	0.645	
Shannon Index of Landscape Eveness									
Forest Units	indicator			0.4544	0.7104	0.568	0.572	0.593	
Age Classes	indicator			0.6528	1.0872	0.823	0.851	0.954	
Habitat Units	indicator			0.4344	0.6612	0.551	0.546	0.557	
Indicators of Sustainability		NA	NA						NA
Sub Unit: Cochrane									
1. Forest Diversity Indicators of Sustainability									
A. Forest Diversity Indices				>=	<=				
Shannon Weiner Index of Landscape Heterogeneity									
Forest Units	indicator			1.4296	2.1744	1.812	1.811	1.834	
Age Classes	indicator			1.9752	3.5436	2.469	2.525	2.747	
Habitat Units	indicator			1.4464	2.4024	2.002	1.98	1.946	
Simpsons Index of Landscape Heterogeneity									
Forest Units	indicator			0.6368	0.966	0.805	0.801	0.8	
Age Classes	indicator			0.716	1.1268	0.895	0.906	0.926	
Habitat Units	indicator			0.6248	1.0008	0.834	0.828	0.818	

Shannon Index of Landscape Eveness									
Forest Units	indicator			0.5456	0.8484	0.707	0.706	0.715	
Age Classes	indicator			0.6776	1.0776	0.891	0.874	0.843	
Habitat Units	indicator			0.548	0.9108	0.759	0.75	0.737	
2. Multiple Benefits to Society Indicators of Sustainability **A. Managed Crown Forest Available for Timber Production**		NA	NA						The results indicate that forest unit area for the majority of the forest units in the selected management alternative were within the bounds of natural variation for all terms. Where results were not within the bounds the predominant cause was the rarity of the forest unit in the initial term. Small increases in the amount of area would cause the forest unit areas to exceed the upper bounds. Therefore, the selected management alternative was considered sustainable in terms of managed Crown forest available for timber production. Pg 168 of 2008-2010 CFMP.
Sub Unit: Moose River									
Total All Fus	ha			no significant decrease		404,552	408,966	407,065	
Bog	ha			no significant decrease		0	0	0	
Bw1	ha			no significant decrease		90	124	302	
LC1	ha			no significant decrease		14263	16783	27354	
LH1	ha			no significant decrease		0	0	0	
MW1	ha			no significant decrease		1374	2732	3715	
MW2	ha			no significant decrease		8088	8265	8010	
PJ1	ha			no significant decrease		11018	11059	10651	
PJ2	ha			no significant decrease		5742	5822	7254	
PO1	ha			no significant decrease		7468	7717	9235	
SBC	ha			no significant decrease		303262	306611	298028	
SBH	ha			no significant decrease		13849	12789	10703	
SF1	ha			no significant decrease		10438	11453	12302	
SP1	ha			no significant decrease		28960	25610	19512	
Sub Unit: Cochrane									
Total All Fus	ha			no significant decrease		91,215	93,356	93,931	
Bog	ha			no significant decrease		0	0	0	

Bw1	ha			no significant decrease	878	1060	1430	
LC1	ha			no significant decrease	13553	13529	13601	
LH1	ha			no significant decrease	27	27	27	
MW1	ha			no significant decrease	160	167	133	
MW2	ha			no significant decrease	11760	10583	8740	
PJ1	ha			no significant decrease	237	240	106	
PJ2	ha			no significant decrease	116	219	892	
PO1	ha			no significant decrease	22470	22575	22902	
SBC	ha			no significant decrease	29337	31699	33326	
SBH	ha			no significant decrease	955	940	813	
SF1	ha			no significant decrease	9290	9610	8288	
SP1	ha			no significant decrease	2432	2708	3672	
B. Available Harvest Area Available to be Utilized		NA	NA					A total of 100% of the available harvest area available from the selected management alternative was expected to be utilized as the timber demand exceeds the supply and markets will be sought for those species currently underutilized . Pg 169 of 2008-2010 CFMP.
Total All Fus	%			No significant change	100	100	100	
Bog	%			No significant change	100	100	100	
Bw1	%			No significant change	100	100	100	
LC1	%			No significant change	100	100	100	
LH1	%			No significant change	100	100	100	
MW1	%			No significant change	100	100	100	
MW2	%			No significant change	100	100	100	
PJ1	%			No significant change	100	100	100	
PJ2	%			No significant change	100	100	100	
PO1	%			No significant change	100	100	100	
SB1	%			No significant change	100	100	100	
SF1	%			No significant change	100	100	100	

SPI	%			No significant change	100	100	100	
Non-Quantifiable								
To provide suitable marten habitat on the Cochrane - Moose River Management Unit	Marten Core areas have been defined spatially and deferred from the productive land base modeled in SFMM for 60 years. These areas were established by MNR and Company staff and meet the guideline requirements. This objective is fully achieved in this management alternative.							
Ensure the genetic diversity of trees is conserved	Maintaining a seed bank for black and white spruce and jack pine with seeds collected from the appropriate seedzone. Continued use of natural regeneration via silviculture treatments such as careful logging, and HARP will maintain local genetics and diversity adapted to those sites.							
Provide for the long-term health and vigour of Crown forests by using forest practices that, within the limits of silvicultural requirements emulate natural disturbance patterns and landscape patterns	Harvest patches must be separated from each other by forest patches of at least one structural age class difference of +/- 20 years. This target is achieved through the selection of harvest areas by leaving unharvested patches that will generally be of sufficiently young age to facilitate a return harvest following the 20 year plan horizon.							
Minimize the adverse affects on water quality and aquatic habitat within areas of harvest operations and soil	Forest management activities will be conducted in a manner that minimizes and mitigates the impacts on the physical environment, water quality and aquatic habitat within areas of forest operations. Specific strategies are achieved through the application of appropriate guidelines							
Ensure that the available forest is protected from sustained deforestation or conversion to other uses	Annual surveys will be conducted to assess the regeneration needs of harvested sites. From these assessments the appropraite silvicultural package will be developed to ensure successful regeneration of the site.							
Socioeconomic Evaluation	Based on the yearly volume generated by this alternative, a reasonably stable level of economic activity is sustained. This economic activity provides benefits to local, regional, and provincial economies.							

* Based on the 2003-2008 FMP therefore doesnt not necessarily have all of the required fields (Timing of Assessment and Desireable Levels)

MANAGEMENT UNIT NAME: Cochrane Moose River Management Unit

PLAN PERIOD: 2003 TO 2023
ANNUAL REPORT: April 1, 2007 to March 31, 2008

AR-15 Summary of Frequency Distribution of Forest Disturbances by Size Class

Size Class (ha)	Frequency of Forest Disturbances						
	Number			Percent			
	Plan Start	Projected Plan End	Actual To Date	Plan Start	Projected Plan End	Actual To Date	*Template
10 - 130	295	298	279	66.7%	67.1%	66.4%	27.0%
131 - 260	83	78	79	18.8%	17.6%	18.8%	10.0%
261-520	36	30	31	8.1%	6.8%	7.4%	19.0%
521-1040	14	24	16	3.2%	5.4%	3.8%	18.0%
1041-2500	8	7	13	1.8%	1.6%	3.1%	15.0%
2501-5000	3	3	1	0.7%	0.7%	0.2%	9.0%
5001-10000	1	2	0	0.2%	0.5%	0.0%	4.0%
10000+	2	2	1	0.5%	0.5%	0.2%	0.0%
Total	442	444	420	100.0%	100.0%	100.0%	102.0%

Note: Template based on FMGENDAR - analysis of fires in Site Region 3E completed by CNFER

Note: This table is required in the annual report for the last year of a plan. Normally, the 2007/2008 annual report will be the last annual report for a 2003 to 2008 FMP.

RPFO-13 Comparison of Projected, Actual, and Desired Future Fores[illegible]ndition

FOR THE MANAGED CROWN FOREST AREA AVAILABLE FOR TIMBER PRODUCTION

			Forest Condition (ha)			Desired Future Forest Condition (ha)	
2000 FMP Forest Unit (s)	**Age Class**	**Stage of Management**	**Start of Term**	**End of Term Actual**	**Projected <2023>**	**Past Term <2063>**	**Current Term <2063>**
BOG	1-20 21-40 41-60 61-80 81-100 101-120 121-140 141-160 161-180 181+						
		Total	0	0	0	0	0

			Forest Condition (ha)			Desired Future Forest Condition (ha)	
2000 FMP Forest Unit (s)	**Age Class**	**Stage of Management**	**Start of Term**	**End of Term Actual**	**Projected <2023>**	**Past Term <2063>**	**Current Term <2063>**
BW1	1-20		223	*	219.4	260.9	*
	21-40		89		225.8	246.9	
	41-60		228		88.3	219.8	
	61-80		256		226.2	222.2	
	81-100		172		254	86.9	
	101-120				170.8	222.6	
	121-140					244.2	
	141-160					91.8	
	161-180						
	181+						
		Total	968	0	1184.5	1595.2	0

			Forest Condition (ha)			Desired Future Forest Condition (ha)	
2000 FMP Forest Unit (s)	**Age Class**	**Stage of Management**	**Start of Term**	**End of Term Actual**	**Projected <2023>**	**Past Term <2063>**	**Current Term <2063>**
LC1	1-20		1828		6223.6	6351.1	
	21-40		672		1831	6309.3	
	41-60		3211		666.6	6140.5	
	61-80		4222		3185.4	1801.9	
	81-100		4967		4188.4	656.1	
	101-120		3218		4927.4	3134.8	
	121-140		4834		485.1	1841.9	
	141-160		4841		3791.5	495.6	
	161-180		15		4981.2	210.9	
	181+		8		31.1	10291.5	
		Total	27816	0	30311.3	37233.5	0

			Forest Condition (ha)			Desired Future Forest Condition (ha)	
2000 FMP Forest Unit (s)	**Age Class**	**Stage of Management**	**Start of Term**	**End of Term Actual**	**Projected <2023>**	**Past Term <2063>**	**Current Term <2063>**
LH1	1-20		4		0.2	0.2	
	21-40		2		4	0.2	
	41-60		9		2	0.2	
	61-80		12		8.9	3.9	
	81-100				11.9	2.0	
	101-120					8.8	
	121-140					11.7	
	141-160						
	161-180						
	181+						
		Total	27	0	27	27.0	0

			Forest Condition (ha)			Desired Future Forest Condition (ha)	
2000 FMP Forest Unit (s)	**Age Class**	**Stage of Management**	**Start of Term**	**End of Term Actual**	**Projected <2023>**	**Past Term <2063>**	**Current Term <2063>**
MW1	1-20		382		259.2	640.3	
	21-40		103		1151.1	423.1	
	41-60		184		676.5	745.1	
	61-80		533		182.5	1394.2	
	81-100		280		528.8	407.6	
	101-120		26		100.8	96.7	
	121-140		26			155.3	
	141-160						
	161-180						
	181+						
		Total	1534	0	2898.9	3862.2	0

			Forest Condition (ha)			Desired Future Forest Condition (ha)	
2000 FMP Forest Unit (s)	**Age Class**	**Stage of Management**	**Start of Term**	**End of Term Actual**	**Projected <2023>**	**Past Term <2063>**	**Current Term <2063>**
MW2	1-20		3016		1866.6	2265.5	
	21-40		2600		3209.2	2281.1	
	41-60		4808		2808.3	2060.9	
	61-80		6346		4888.7	3718.1	
	81-100		2155		4646.2	2971.7	
	101-120		618		465.4	3140.9	
	121-140		228		194.8	1128.4	
	141-160		77		337.1	62.6	
	161-180				414.6	56.2	
	181+				17.1	152.8	
		Total	19848	0	18848	17838.0	0

			Forest Condition (ha)			Desired Future Forest Condition (ha)	
2000 FMP Forest Unit (s)	**Age Class**	**Stage of Management**	**Start of Term**	**End of Term Actual**	**Projected <2023>**	**Past Term <2063>**	**Current Term <2063>**
PJ1	1-20		3612		2588.3	2389.5	
	21-40		882		3591.4	2294.3	
	41-60		1341		875	2554.5	
	61-80		1974		1330.3	3534.3	
	81-100		2588		1958.3	198.1	
	101-120		830		842.4	116.2	
	121-140		28		101.5	33.2	
	141-160				11.9	29.2	
	161-180						
	181+						
		Total	11255	0	11299.1	11149.3	0

2000 FMP Forest Unit (s)	Age Class	Stage of Management	Start of Term	End of Term Actual	Projected <2023>	Past Term <2063>	Current Term <2063>
PJ2	1-20		562		2292.2	1557.0	
	21-40		123		557.5	1783.8	
	41-60		871		122	2255.8	
	61-80		2231		864.1	548.7	
	81-100		1355		2159.5	120.1	
	101-120		505			828.9	
	121-140		161		4.6	54.7	
	141-160		9		2.6	8.0	
	161-180					0.0	
	181+		41		40.7	40.0	
		Total	5858	0	6043.2	7196.9	0

			Forest Condition (ha)			Desired Future Forest Condition (ha)	
2000 FMP Forest Unit (s)	**Age Class**	**Stage of Management**	**Start of Term**	**End of Term Actual**	**Projected <2023>**	**Past Term <2063>**	**Current Term <2063>**
PO1	1-20		5496		8677.2	8045.7	
	21-40		4848		5681	7975.0	
	41-60		8239		4809.4	8723.2	
	61-80		9868		8173.3	4686.6	
	81-100		1362		2403.8	1173.2	
	101-120		91		538.5	118.1	
	121-140		14		8.9	66.2	
	141-160					159.1	
	161-180					0.3	
	181+						
		Total	29918	0	30292.1	30947.5	0

			Forest Condition (ha)			Desired Future Forest Condition (ha)	
2000 FMP Forest Unit (s)	**Age Class**	**Stage of Management**	**Start of Term**	**End of Term Actual**	**Projected <2023>**	**Past Term <2063>**	**Current Term <2063>**
SBC	1-20		53601		60750.2	57230.9	
	21-40		8379		58409.1	58459.5	
	41-60		12382		8312.2	62330.5	
	61-80		31837		12283.3	57481.8	
	81-100		37157		31583.3	8180.3	
	101-120		48295		36860.9	12088.3	
	121-140		90045		15141.4	9180.2	
	141-160		49751		65695.1	9088.9	
	161-180		955		48392.8	2626.3	
	181+		197		882.5	59379.7	
		Total	332599	0	338310.8	336046.4	0

			Forest Condition (ha)			Desired Future Forest Condition (ha)	
2000 FMP Forest Unit (s)	**Age Class**	**Stage of Management**	**Start of Term**	**End of Term Actual**	**Projected <2023>**	**Past Term <2063>**	**Current Term <2063>**
SBH	1-20						
	21-40						
	41-60						
	61-80						
	81-100						
	101-120		1632				
	121-140		6002		951.6	484.6	
	141-160		6821		5927.3	3993.0	
	161-180		251		6632	610.8	
	181+		98		217.5	6897.0	
		Total	14804	0	13728.4	11985.5	0

			Forest Condition (ha)			Desired Future Forest Condition (ha)	
2000 FMP Forest Unit (s)	**Age Class**	**Stage of Management**	**Start of Term**	**End of Term Actual**	**Projected <2023>**	**Past Term <2063>**	**Current Term <2063>**
SF1	1-20		4707		2986.5	3096.7	
	21-40		3410		5373.8	2681.6	
	41-60		3360		4231.5	3440.2	
	61-80		2235		3645.9	6147.4	
	81-100		1947		2172.2	4865.6	
	101-120		948		777.9	996.9	
	121-140		1613		508.4	185.7	
	141-160		1449		963.2	107.4	
	161-180		59		403.2	8.0	
	181+				1	2.0	
		Total	19728	0	21063.6	21531.5	0

			Forest Condition (ha)			Desired Future Forest Condition (ha)	
2000 FMP Forest Unit (s)	**Age Class**	**Stage of Management**	**Start of Term**	**End of Term Actual**	**Projected <2023>**	**Past Term <2063>**	**Current Term <2063>**
SP1	1-20		3873		6540.7	4525.0	
	21-40		1181		3842.1	5255.0	
	41-60		3105		1171.6	6436.9	
	61-80		5443		3116.2	3813.3	
	81-100		5476		5354.1	1207.5	
	101-120		3463		5040.1	2648.3	
	121-140		5387		2129.7	296.1	
	141-160		3450		865.9	309.4	
	161-180		14		257.7	89.9	
	181+					35.1	
		Total	31392	0	28318.1	24616.5	0

* Numbers normally provided from new 5yr term of plan, the 2008-2010 FMP is a contingency plan using the same strategic direction as the 2003-2008 FMP and there fore the numbers are the same

MANAGEMENT UNIT NAME: Cochrane Moose River Management Unit
PLAN PERIOD: 2003 TO 2023
ANNUAL REPORT: April 1, 2007 to March 31, 2008

RPFO-14 Summary Report of Managed Forest Area For Timber Production

Plan Term	Production Forest Available for Timber Production (ha)											
	<Year 5>		<Year 10>		<Year 15>		<Year 20>		<Year 40>	<Year 60>	<Year 80>	<Year 100>
	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Predicted	Predicted	Predicted
1998-2003	NA	495747	NA	*	NA		568895		561309	550653	542462	535758
2003-2008	NA	*	499789		NA		502325		504355	504030	502631	500996

NA	Not available
*	For the 2008-2010 period, the area is the same as the 2003-2008 period due to contingency plan

Numbers in this table are affected by the transfer of approx 18,200 ha from CMU to SRF and 4,100 ha from MRMU to SRF during amalgamation of CMU & MRMU in 2003

RPFO-15 SUMMARY REPORT OF LANDSCAPE PATTERN OR FOREST DIVERSITY INDICES

Plan Term	Acceptable Levels			Forest or Landscape Diversity Index											
				<Year 5>		<Year 10>		<Year 15>		<Year 20>		<Year 40>	<Year 60>	<Year 80>	<Year 100>
	Index	From	To	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Predicted	Predicted	Predicted
1998-2003 CMU															
	1. Forest Units	1.4296	2.1744	na	2.031	1.812		na		1.811		1.814	1.82	1.829	1.834
	Age Class	1.9752	3.5436	na	2.473	2.469		na		2.525		2.648	2.717	2.782	2.747
	Habitat Units	1.4464	2.4024	na	2.292	2.002		na		1.98		1.966	1.958	1.953	1.946
	2. Forest Units	0.6368	0.966	na	0.847	0.805		na		0.801		0.799	0.798	0.799	0.8
	Age Class	0.716	1.1268	na	0.896	0.895		na		0.906		0.919	0.924	0.929	0.926
	Habitat Units	0.6248	1.0008	na	0.673	0.834		na		0.828		0.823	0.82	0.819	0.818
	3. Forest Units	0.5456	0.8484	na	0.847	0.707		na		0.706		0.707	0.709	0.713	0.715
	Age Class	0.6776	1.0776	na	0.759	0.891		na		0.874		0.884	0.879	0.875	0.843

	Habitat Units	0.548	0.9108	na	0.846	0.759		na		0.75		0.745	0.742	0.74	0.737
1998-2003 MRMU															
	1. Forest Units	1.1296	1.7652	na	1.168	1.412		na		1.422		1.435	1.452	1.464	1.473
	Age Class	2.036	3.5436	na	2.477	2.545		na		2.705		2.791	2.917	3.041	3.08
	Habitat Units	1.1488	1.7436	na	1.722	1.453		na		1.442		1.447	1.457	1.464	1.47
	2. Forest Units	0.5064	0.7872	na	0.597	0.634		na		0.634		0.638	0.643	0.647	0.65
	Age Class	0.7248	1.1244	na	0.894	0.906		na		0.921		0.926	0.937	0.947	0.951
	Habitat Units	0.5024	0.7716	na	0.597	0.634		na		0.631		0.634	0.638	0.642	0.645
	3. Forest Units	0.4544	0.7104	na	0.562	0.568		na		0.572		0.578	0.584	0.589	0.593
	Age Class	0.6528	1.0872	na	0.814	0.823		na		0.851		0.857	0.895	0.933	0.954
	Habitat Units	0.4344	0.6612	na	0.636	0.551		na		0.546		0.548	0.552	0.555	0.557
1998-03 CMRMU	1. Forest Units	na	na	na	1.573										
	Age Class	na	na	na	2.637										
	Habitat Units	na	na	na	1.641										

	2. Forest Units	na	na	na	0.680										
	Age Class	na	na	na	0.917										
	Habitat Units	na	na	na	0.686										
	3. Forest Units	na	na	na	0.613										
	Age Class	na	na	na	0.853										
	Habitat Units	na	na	na	0.606										
2003-08	1. Forest Units	1.1296	1.7652	na		1.571		na		1.570		1.570	1.574	1.580	1.583
	Age Class	2.036	3.5436	na		2.725		na		2.779		2.848	2.947	3.046	3.086
	Habitat Units	1.1488	1.7436	na		1.629		na		1.623		1.621	1.625	1.629	1.632
	2. Forest Units	0.5064	0.7872	na		0.678		na		0.676		0.676	0.678	0.680	0.682
	Age Class	0.7248	1.1244	na		0.926		na		0.929		0.933	0.940	0.947	0.950
	Habitat Units	0.5024	0.7716	na		0.683		na		0.681		0.681	0.684	0.686	0.688
	3. Forest Units	0.4544	0.7104	na		0.612		na		0.612		0.612	0.614	0.616	0.617
	Age Class	0.6528	1.0872	na		0.869		na		0.874		0.874	0.905	0.935	0.947

	Habitat Units	0.4344	0.6612	na		0.602		na		0.599		0.599	0.600	0.601	0.603

1. Shannon Weiner Index of Landscape Heterogeneity

2. Simpsons Index of Landscape Heterogeneity

3. Shannon Weiner Index of Landscape Eveness

N/A - not available

a) Shannon-Weiner Index of Landscape Heterogenity

b) Simpsons Index of Landscape Heterogenity

c) Shannon Index of Landscape Evenness

3. Wildlife Habitat Unit
Distribution

a) Shannon-Weiner Index of Landscape Heterogenity

b) Simpsons Index of Landscape Heterogenity

c) Shannon Index of Landscape Evenness

MANAGEMENT UNIT NAME: Cochrane Moose River Management Unit

PLAN PERIOD: 2003 TO 2023

ANNUAL REPORT: April 1, 2007 to March 31, 2008

RPFO-16 Summary Report of Selected Habitat for Selected Wildlife Species

Plan Term	Selected Wildlife Species	Area of Habitat Available (km^2)											
		<Year 5>		<Year 10>		<Year 15>		<Year 20>		<Year 40>	<Year 60>	<Year 80>	<Year 100>
		Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Predicted	Predicted	Predicted
1998-2003	Woodland Caribou	N/A	44	35		N/A		N/A		31	34	25	24
	Marten	N/A	804	480		N/A		N/A		361	362	410	418
	Moose (foraging)	N/A	99	75		N/A		N/A		70	69	71	73
	Moose (winter)	N/A	781	514		N/A		N/A		521	523	522	516
2003-08	Bay-breasted Warbler	N/A		610		N/A		604	0	566	579	581	572
	Black-backed Woodpecker	N/A		351		N/A		348	0	325	328	338	328
	Black Bear (foraging)	N/A		16		N/A		14	0	14	14	14	16
	Black Bear (fall,winter)	N/A		369		N/A		344	0	333	338	347	354
	Boreal Chickadee	N/A		2146		N/A		2153	0	2118	2069	2049	2090
	Blue-spotted Salamander	N/A		0		N/A		0	0	0	0	0	0
	Lynx	N/A		309		N/A		311	0	310	305	313	322
	Woodland Caribou	N/A		43		N/A		38	0	38	36	28	25
	Deer Mouse	N/A		119		N/A		124	0	112	110	112	112
	Great Grey Owl	N/A		132		N/A		134	0	124	129	128	131
	Least Flycatcher	N/A		1960		N/A		1972	0	1937	1923	1923	1969
	Marten	N/A		785		N/A		752	0	672	635	649	636
	Moose (foraging)	N/A		110		N/A		115	0	105	101	103	102
	Moose (winter)	N/A		779		N/A		772	0	775	777	775	768

	Northern Flying Squirrel	N/A		796		N/A		772	0	737	751	735	706
	Pileated Woodpecker	N/A		7		N/A		16	0	37	17	22	20
	Ruby-crowned Kinglet	N/A		3401		N/A		3137	0	3193	3265	3301	3409
	Ruffed Grouse	N/A		114		N/A		121	0	135	149	160	170
	Snowshoe Hare	N/A		309		N/A		311	0	310	305	313	322
	Spruce Grouse	N/A		41		N/A		45	0	44	46	42	42
	White-throated Sparrow	N/A		225		N/A		242	0	220	208	209	210

N/A - not available

RPFO-18 Summary Report of Selected Measurable Indicators of Forest Sustainability Criteria

Measurable Indicator	Indicator Values By Plan Term					
		1998 - 2003	2003-2008	<year> to <year>	<year> to <year>	<year> to <year>
Total productive Crown forest (by working group) (ha)						
	S		592			
	Sb	695,456	706,571			
	Sw	3,234	6,373			
	Pj	20,938	21,520			
	Bf	10,226	9,635			
	Po	61,038	56,921			
	Bw	3,480	2,728			
	Ce	845	1,437			
	La	11,131	10,944			
	Oc	134	140			
	Pw					
	Pr					
	A	9	9			
	Ms					
	By					
	OH					
	He					
Total		806,491	816,870			

% of Available Harvest Area actually utilized (by forest unit)	1998-2003	2003-2008					
	Bw1	BW1	31%	0%			
	Oc	LC1	27%	40%			
		MW1		72%			
	Mxwd	MW2	68%	57%			
	Pj1	PJ1	65%	80%			
		PJ2		79%			
	Po1	PO1	82%	70%			
	Sp2	SBC	74%	36%			
	Sp3	SBH	40%	20%			
	Mxcon	SF1	63%	56%			
	Sp1	SP1	69%	46%			
	Bf1		31%				
Ratio of area of riparian reserve to length of shoreline adjacent to timber harvest activity				8.23 ha/km			
% of Native communities in or adjacent to the management unit which are involved in the special Native consultation option			33%	66%			
% of forecasted silvicultural budget requirement actually received			59.1%	118.7%			
Value added (millions $) (Generated by SEIM - Prov. GDP)			$ 29.056	$ 100.050			

Local citizens committee self-evaluation of their effectiveness (1-10)	6.7	7.6			